

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF VIRGINIA
ROANOKE DIVISION

- - - - -
JEFFREY HODGES, :
TOMMY LEE BONDS, and :
JOHN PAUL SPANGLER, :
:
Plaintiffs :
:
-vs- : Civil Action
: No. 7:12cv00362
FEDERAL-MOGUL CORPORATION, :
et al., :
:
Defendants :
- - - - -

November 11, 2013
9:30 a.m.

DEPOSITION OF:
MARTIN SCHLOSS

CENTRAL VIRGINIA REPORTERS
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1 Q Okay. If Mr. Hodges, Mr. Bonds, and
2 Mr. Spangler were not present cleaning the ductwork at
3 Federal-Mogul on December 31, 2010, would that
4 explosion have occurred?

5 A Could that explosion have occurred, or
6 would that --

7 Q I am asking first would that.

8 A It's possible that the explosion could
9 have occurred based on the information that I have
10 saw. The role that the employees played in that
11 decision -- or in that explosion, it's -- I would say
12 based on what I found, it could have exploded without
13 them being there. That's my -- my professional
14 opinion is, is from what I saw and working on
15 different dust collectors like that that there's a
16 possibility that that could happen.

17 Q Okay. So to put it another way, I
18 suppose -- well, let me go into another question with
19 that. Do you have an opinion as to whether or not any
20 of the actions taken by the plaintiffs that day in
21 cleaning the ductwork caused or contributed to the
22 explosion occurring specifically on that day?

23 A From my analysis of the explosion and
24 of the equipment and the videotape and the -- you

1 know, based on all of those things and where I
2 determined the explosion originate, it would have made
3 no difference if they were working on it or not
4 working on it.

5 Q Okay. Why is that?

6 A Because I don't think they had -- in my
7 professional opinion, the explosion didn't originate
8 at the employees. It originated in the dust
9 collector, and there was nothing that the employees
10 were doing that was going to change that fact or
11 contribute to it in the dust collector per my
12 findings.

13 Q All right. And this ventilation system
14 had been operating for approximately seven years --

15 A Yes.

16 Q -- prior to this day?

17 A Uh-huh.

18 Q Okay. Were there any conditions that
19 were present on December 31, 2010, that were different
20 than any other day that it had been operating up until
21 then?

22 A I don't have that information.

23 Q Okay. Do you have an opinion with a
24 reasonable degree of engineering probability as to why

1 That's something that is present at all times and had
2 been present in this system every day, correct?

3 A Yes.

4 Q Okay. Fuel. In this case, what, in
5 your opinion, was the fuel for the explosion?

6 A The aluminum dust.

7 Q And, again, the aluminum dust was
8 something that had been present in the system since it
9 started operating some seven years earlier, correct?

10 A Yes.

11 Q And was there any difference on this
12 day in terms of the characteristics of the aluminum
13 dust in the system?

14 A I -- without, you know, analyzing the
15 dust, I would assume that the same equipment and their
16 process is the same day after day, and the dust is
17 going to be the same every day that goes into it. I
18 have no information of a process change that was made
19 prior to this or that had been made in the seven
20 years.

21 Q All right. I am going to skip over
22 ignition source for just a second because I know you
23 already mentioned the exothermic reaction there.
24 Dispersion of the dust cloud, is that a condition that

1 procedures of the workers?

2 A When I teach it and teach safe
3 operation of dust collectors, lockout/tagout is a big
4 issue in it.

5 Q Okay. And are you familiar that with
6 lockout/tagout that it's the individual working on the
7 equipment that's responsible for making sure that's
8 done? Are you familiar with that standard?

9 A Yes. And I don't know who locked out
10 what or how many locks were on it.

11 Q Okay.

12 A Or what Federal-Mogul's internal
13 procedures are or requirements.

14 Q Let's see. Now, this may be similar,
15 but the operational condition of the plant, I guess
16 that -- we are talking about the same thing, either --
17 whether that's the machines or the dust collection
18 system. And, again, you were just provided the
19 information that there was a lockout and tagout, but
20 you are not -- you don't have any information as to
21 whether or not that was checked by the plaintiffs?

22 A No.

23 Q Or who did it?

24 A That was outside the scope --

1 Q Or whether it was actually done?

2 A That was outside of the scope of what I
3 was looking at.

4 Q You mentioned specifically water
5 vapor-generating equipment in the plant?

6 A Yes.

7 Q Where did you get information about
8 that subject?

9 A From the proposal -- or from
10 Federal-Mogul's specs on the original project, it
11 required two dry dust collectors and then two wet dust
12 collectors for the process, a different part of the
13 process. A wet dust collector works by either
14 spraying water into the air to take out the
15 particulate or by running the air through a tank and
16 through a bath to remove the particulate as well.

17 Q Okay.

18 A There was talking about -- then their
19 specifications also had a sludge-handling equipment,
20 which meant what was coming off of the dust collector
21 is going to be a mixture of both particulate and water
22 that's going to come out wet to be dried.

23 So just the inclusion of those two
24 pieces of equipment in the general area, because they

1 were all installed at the same time for this
2 production line, would mean there would be vapor --
3 free water vapor in the air.

4 Q Okay. And that would be for the entire
5 plant?

6 A Well, I mean, you would have just in
7 the -- I looked at just the area of where they were
8 doing the production side of it.

9 Q Okay. With respect to the water
10 vapor-generating equipment, okay, does that raise the
11 relative humidity of the air for the entire plant?

12 A Yes. Relative humidity is a number
13 that says just exactly what it is. It's relative to
14 how much moisture does it have versus how much
15 moisture can it have. So what it was actually doing
16 was raising the entire dew point of the plant.

17 Q Didn't you do any calculations for the
18 extent to which the dew point was raised in the
19 plant --

20 A No.

21 Q -- as a result of this equipment?

22 A Other than my experience with wet dust
23 collectors is you are putting water vapor into the
24 plant. You have got employees that are putting water

1 vapor into the plant.

2 Q Is there any way to test that?

3 A Yes.

4 Q How would you test that?

5 A You can test versus the outside. You
6 take a measuring device that's going to measure
7 temperature and wet-bulb temperature or temperature
8 and absolute humidity. There is different devices
9 that you can tell how much moisture is being added.

10 Q And for this case, did -- did you do
11 any type of model or any type of testing -- well,
12 withdrawn. Let me ask you this first: Are the water
13 vapor-producing equipment that you referred to still
14 operating at Federal-Mogul?

15 A The understanding I had was the plant
16 was running at -- up until the time it was shut
17 down --

18 Q I'm sorry to cut you off. Not that
19 day. I am talking about after the explosion and when
20 you got the request to do your review in this case.
21 Do you know, as of today or at any time since you have
22 had it, whether or not that equipment is still being
23 used?

24 A I don't have any direct knowledge.

1 Q Okay. Have you done any testing or
2 created any models to determine the extent to which
3 that particular equipment in the Federal-Mogul plant
4 would raise the dew point or increase the relative
5 humidity for the plant air?

6 A No, but I know how to do it. I do it
7 as part of my business. I just did not do it in this
8 case.

9 Q So, as you sit here today, can you
10 provide any basis for -- withdrawn. Can you tell us
11 what the dew point was for the Federal-Mogul plant
12 inside the plant on December 31 of 2010?

13 A No.

14 Q Do you know whether or not the water
15 vapor-producing equipment was operating at
16 Federal-Mogul on that day?

17 A I have been told that it was.

18 Q Okay. Told by who?

19 A Again, when I asked the question was
20 the plant operating, they said up to the time when it
21 was shut down to start cleaning the ductwork.

22 Q And when you say the plant being shut
23 down, is that the entire plant or --

24 A No, the process.

1 Q -- just the production line that was
2 for the aluminum dust, that created the aluminum dust?

3 A My understanding was -- again, I didn't
4 check to see if the rest of the plant was running. My
5 interest was in the lines that were served by that
6 dust collector. And if you were running the process
7 -- if you were running the dry dust collectors, you
8 would have to be running the wet dust collectors to
9 handle another part of this same production line. So
10 my assumption was is that since both of them were
11 running at that -- required to run, that it would be a
12 requirement that both the dust collector and the wet
13 dust collector would be running. And, again, that's
14 based on how the system is currently designed or --
15 and what was specified in Federal-Mogul's design
16 documents.

17 Q Okay. And based on your prior answer,
18 it's your understanding that that particular line, the
19 aluminum dust ventilation system, including the water
20 vapor-producing equipment, had been shut down between
21 a half hour and an hour and a half before LCM started
22 its work?

23 A Yes.

24 Q The fact that it's shut down, does that

1 the area where the plaintiffs were working.

2 A That could have been just by the
3 vacuum. It could have been by the flow.

4 Q Okay.

5 A I guess any material flowing through a
6 pipe like that is going to cause a static buildup.
7 Just different materials dissipate it differently.

8 Q But you indicated previously that
9 that -- that the creation of the static electricity
10 and generation of sparks was a potential source of
11 ignition for combustion and explosion in this case?

12 A In -- it's a source of sparks and
13 having air going through a PVC pipe, yes, anything
14 that's ungrounded. Even ungrounded or unbonded steel,
15 you can still have the same issues.

16 Q Okay. Now, with respect to the
17 explosion itself, in your report you indicate that the
18 number one fact that you relied upon here was the
19 testimony of Mr. Hodges that he saw an explosion in
20 the bag house; is that correct?

21 A He saw a fireball coming down the
22 ductwork. He said he could see past the backdraft --
23 or backblast damper into the elbow, and he saw the
24 fireball originate from that point.

1 Q Okay. And what did you do to test that
2 account from Mr. Hodges?

3 A The other thing I used in doing that
4 was the video and looked at the flashes and where
5 those flashes originated. And so by using that with
6 his reaction, I determined that the explosion had
7 taken place in the duct -- in the bag house, not in
8 the ductwork, the initial explosion.

9 Q Did you consider Mr. Hodges' statement
10 to be reliable?

11 A Yes.

12 Q Okay. And what was that based on?

13 A Based on that he was there and seeing
14 it. I have talked to other people that have been
15 involved in them, in explosions and in flash fires,
16 and found them to be very reliable in what they
17 remember. It may be something as easy as they saw,
18 you know, bright orange flash coming out of a
19 55-gallon drum and landing 30 feet or 40 feet away
20 from the -- but they remember where the origin and
21 what they saw.

22 Q Okay. And when Mr. Hodges stated that
23 he could see that the fireball originated beyond the
24 damper, or the flue or whatever he called it, okay,

1 did that give you any information?

2 A That the fireball had originated in the
3 bag house.

4 Q In terms of his description --
5 withdrawn. Do you recall what his description of the
6 damper was at his deposition?

7 A No, but I can look at it.

8 THE WITNESS: Do you have a copy of his
9 deposition, for Hodges? I may have a copy,
10 just that page.

11 MR. BROWN: No, not without my notes on
12 it, but we can -- we can take a quick break
13 and get a copy of these pages if you like.
14 Want to do that?

15 MR. HUDGINS: What were you looking
16 for?

17 MR. MORRIS: Let me see if I want --

18 MR. ALEXANDER: Does he want it?

19

20 BY MR. MORRIS:

21 Q If you have his deposition, if you
22 looked at Page 101 --

23 MR. BROWN: It's on a number of pages.

24 It starts well before that.

1 prejudiced.

2 MR. ALEXANDER: You are right. Thank
3 you.

4 MR. HUDGINS: Without belaboring the
5 whole thing, I think everybody on this side
6 of the table would disagree that his
7 questions are misleading in any respect. And
8 the witness who has indicated that he
9 reviewed the record is in a position to agree
10 or disagree with the foundation for his
11 opinion.

12 MR. BROWN: I hear you. I made my
13 objection. Unless you want to continue to
14 make the argument, then why don't we move on.

15 MR. HUDGINS: That's all.

16 THE VIDEOGRAPHER: Off the Record.

17

18 (Discussion off the Record.)

19

20 BY MR. MORRIS:

21 Q Mr. Schloss, thank you for your
22 patience. Again, now, referring back to Chapter 17 in
23 NFPA 921, one of the obligations that you have as an
24 investigator is to test witness statements and, in

1 know.

2 So that is what my -- that's what my
3 objection is, is that when you characterize
4 it, you are characterizing him saying that
5 this is the way it is. That is not an
6 accurate characterization. With that, then
7 you can go ahead and ask your questions. I
8 just didn't want to do that in front of the
9 witness.

10 MR. MORRIS: I appreciate that. Thank
11 you.

12 MR. HUDGINS: Assuming we were at trial
13 and you had just gone to the bench and made
14 that same objection, wouldn't the response of
15 the court be you're welcome to redirect your
16 witness and bring that out as part of your
17 case?

18 MR. BROWN: My duty in a deposition is
19 to, if I have a form of the question
20 objection, then I have to bring that up. And
21 I view this as being form of the question. I
22 think it's just misleading and incorrect. So
23 with that said, it's not being done in front
24 of the witness, so nobody is being

1 MR. BROWN: I want to make an objection
2 to your question, line of questioning, in
3 that it's mischaracterizing the deposition
4 testimony of Jeffrey Hodges, testimony as to
5 the condition of the -- or the location of
6 the hinge at the top. The question was on
7 Page 101: Was it a flap or a hinge at the
8 top? And the answer was: I don't know. I
9 know I could see that the flapper was in
10 there, and to me it looked like it pivoted
11 from the center, but I don't know. To
12 categorically say that he is testifying
13 affirmatively that, you know, absolutely this
14 is the way it is is a mischaracterization of
15 the evidence. The evidence is very clear
16 that what he was clear on because what he
17 says is in terms of the location of the -- of
18 the fire. It says on Page 75, But you are
19 clear in your mind that there was some fire
20 that came from behind the damper apparatus?
21 Answer: Yes, absolutely. So you have the
22 location of the fire coming from beyond there
23 absolutely. And in terms of the structure of
24 what he is seeing, he is saying he doesn't

1 Q Where it says witness observations, are
2 you familiar with that section?

3 A Yes.

4 Q Now, based on our discussion of
5 Mr. Hodges' testimony regarding his observations of
6 the backblast damper in addition to his observations
7 of the fireball, did you do anything to support or
8 refute his observations with respect to the condition
9 of the backblast damper?

10 A I don't understand the question.

11 Q Okay. Having read that and heard his
12 description that it was open at the top and it looked
13 like it was hinged in the center, okay, did you do any
14 follow-up in order to assess the -- to either support
15 that statement or refute that statement?

16 MR. BROWN: Before you answer that
17 question, I'd like to make an objection. It
18 may be a speaking objection. Let's go off
19 the Record. Could you leave the room for
20 just a moment?

21 THE VIDEOGRAPHER: Off the Record.

22

23 (Discussion off the Record.)

24

1 any other eyewitnesses to the events.

2 Q Okay. And did you ask whether or not
3 there were any other people present?

4 A I don't remember if I inquired on that
5 or not.

6 Q Have you read any of the depositions of
7 the LCM employees who are not plaintiffs in this case?

8 A No. Well, I did -- versus what's on
9 that list, there is other LCM employees. Danny
10 Collins -- ones I looked at were David Garard, Tommy
11 Lee Bonds, Jeff Hodges, John Paul Spangler, Danny
12 Collins, and Ed Thompson.

13 Q Okay. And was there any information
14 other than from Mr. Hodges that you had in terms of
15 specific facts and observations as to where the
16 explosion occurred?

17 A Not that I recollect.

18 Q Now, referring back to Schloss 1 again,
19 if we look to -- let me get to it -- 17.3.3.15, which
20 is on Page 162 at the top.

21 A 17?

22 Q .3.3.15. It will be at the bottom
23 right of Page 162.

24 A Okay.

1 A Yes.

2 Q Okay. And under 17.1.2 we have -- it's
3 that determination of the origin of the fire involves
4 the coordination of information derived from one or
5 more of the following: 1, witness information. The
6 analysis of observations reported by persons who
7 witnessed the fire or were aware of conditions present
8 at the time of the fire, correct?

9 A Yes.

10 Q And you previously told us that the
11 information that you have is from the depositions of
12 the plaintiffs, correct?

13 A And fact --

14 Q That's one, first?

15 A I mean, Federal-Mogul.

16 Q And the deposition of Federal-Mogul was
17 of David Garard, correct?

18 A Yes.

19 Q But Mr. Garard, you are not aware of
20 whether he was at the plant that day or not?

21 A No.

22 Q Okay.

23 A And I am not familiar with if anybody
24 from Federal-Mogul was at the plant or if there was

1 BY MR. MORRIS:

2 Q Mr. Schloss, we were referring to NFPA
3 921, and we have marked as Schloss 1 for
4 identification today a portion of 921 that starts with
5 Chapter 17, origin determination. Do you see that?

6 A Yes.

7 Q Okay. And would you agree that that's
8 a applicable standard for your investigation in this
9 case?

10 A Yes.

11 Q And do you accept NFPA 921 as
12 authoritative in terms of the investigation of fires
13 and explosions?

14 A Only in the combustible dust side of
15 it. I don't know anything about investigating a house
16 fire or a car fire or something along that.

17 Q Fair enough. As it relates to --

18 A As it relates to combustible --

19 Q -- your field --

20 A -- dust and what I do, yes, it does.

21 Q Okay. And within Chapter 17, origin
22 determination, there is sort of a recap of the
23 methodology and the scientific method for origin
24 determination, correct?

1 that it would be subject to criticism?

2 A Yes.

3 Q And within NFPA 921 in I believe it's
4 Chapter 17, there is a section that deals with witness
5 statements, correct?

6 A To know what chapter and what page and
7 what -- I am not familiar.

8 Q Let's see if we can get to it.

9 MR. MORRIS: Okay. Let's mark this as
10 Schloss 1.

11

12 (Deposition Exhibit Schloss 1 was
13 marked and entered into the Record.)

14

15 MR. BROWN: Do you have a copy for me?

16 MR. MORRIS: I don't.

17 MR. BROWN: Let's just take a moment,
18 and I'll make a copy. Does anybody else want
19 a copy of the exhibit?

20 THE VIDEOGRAPHER: Off the Record.

21

22 (A recess was taken.)

23

24

1 collector.

2 Q So the only relevant fact that you took
3 in order to rely on his testimony was the fact that he
4 said he could see past the damper. The details of
5 that description were not important to you?

6 A No, they were not important to me. I
7 mean, the bigger thing was is that he could see past
8 the damper and see the elbow, and that's where he saw
9 the fireball generate and come out.

10 Q Okay. I saw on your resume that you
11 are a member of NFPA.

12 A Yes.

13 Q And I understand that to be a member of
14 NFPA, all you have to do is pay the dues?

15 A That's right.

16 Q Okay. But you are familiar with NFPA
17 921?

18 A Yes.

19 Q And you use the scientific methodology
20 as directed by NFPA 921?

21 A Yes.

22 Q And if -- is it your opinion that if
23 the scientific methodology as set forth in NFPA 921 is
24 not used in a investigation of a fire or an explosion,

1 top or bottom?

2 A You couldn't tell where it was hinged.

3 Q Could you tell whether it was at the
4 top of the duct or at the bottom of the duct where it
5 was open?

6 A What he saw at that distance, I don't
7 know.

8 Q Okay. So --

9 A I just -- without reading and believing
10 what he described, I used more of the concept that he
11 could see past that and see the elbow.

12 Q Okay. Well, you said previously the
13 fact that you had his -- his testimony that he saw a
14 fireball from --

15 A Yes.

16 Q -- beyond the damper, that you accepted
17 that as true?

18 A Yes.

19 Q Okay. We have testimony from him
20 indicating that his observations of the damper, which
21 he had been able to see for a period of time prior to
22 the explosion occurring, was incorrect?

23 A It was incorrect, but he still said you
24 could see past it to see the elbow going to the dust

1 it would make that much of a difference on him looking
2 at it.

3 Q And do you recall him testifying as
4 follows: Question: Where you saw that you could see
5 a gap on the side, the top or the bottom.

6 MR. BROWN: What page are you on?

7

8 BY MR. MORRIS:

9 Q 101 Line 5. The total question is:
10 That's what I am trying to find out, where you saw
11 that you could see a gap on the side, the top or the
12 bottom. I apologize for the paraphrase. Answer: I
13 could see over the top of it from the center up. Do
14 you recall reading that in his deposition?

15 A Yes.

16 Q Okay.

17 A I don't remember what was just ahead of
18 that.

19 Q Is that an accurate description of the
20 configuration of the backblast damper?

21 A No, but looking down 40 feet of
22 ductwork with a flashlight, that may have been what
23 his interpretation of what he saw is.

24 Q That you couldn't tell whether it was

1 explosion.

2 Q Okay. Where is the hinge located for
3 the flap?

4 A At the top of the flap.

5 Q Do you recall reading in Mr. Hodges'
6 deposition when he was asked: Was the flap of the
7 hinge at the top? And he answered: I don't know. I
8 know that I could see the flapper that was in there,
9 and to me it looked like it pivoted from the center,
10 but I don't know. Do you recall reading that?

11 A Yes. Yes, I recall that.

12 Q Is that an accurate description of the
13 damper?

14 A From the -- the flap would have been
15 hinged at the top. He may have been looking at the --
16 I am not sure what his interpretation of the damper
17 and the hinge was. I used more that he could see past
18 that to see the elbow.

19 Q Do you recall that he testified that he
20 thought it was a center hinge and that it moved both
21 up and down? Do you recall that testimony?

22 A Yes.

23 Q Okay.

24 A I don't see where that -- the design of

1 BY MR. MORRIS:

2 Q For the purposes of my question, okay,
3 can you refer to Page 101?

4 MR. BROWN: He would have to have the
5 deposition. I don't think he has the
6 deposition in there.

7 THE WITNESS: I don't think I do.

8 MR. BROWN: I think he quotes the
9 deposition in his report.

10 THE WITNESS: But I don't think I
11 pulled that out separately.

12

13 BY MR. MORRIS:

14 Q Mr. Schloss, let me ask you another --

15 A Uh-huh.

16 Q Okay. Can you describe for me the
17 construction of the backblast damper?

18 A It's a rectangular box with -- in just
19 general terms, rectangular box with round collars on
20 either end to fit the ductwork, a incline blade that
21 seals against a -- one of those collars to stop the
22 transmission of energy back through the ductwork.
23 It's made to be open while the equipment is running
24 and the air is flowing across it and closed during an

1 did that give you any information?

2 A That the fireball had originated in the
3 bag house.

4 Q In terms of his description --
5 withdrawn. Do you recall what his description of the
6 damper was at his deposition?

7 A No, but I can look at it.

8 THE WITNESS: Do you have a copy of his
9 deposition, for Hodges? I may have a copy,
10 just that page.

11 MR. BROWN: No, not without my notes on
12 it, but we can -- we can take a quick break
13 and get a copy of these pages if you like.
14 Want to do that?

15 MR. HUDGINS: What were you looking
16 for?

17 MR. MORRIS: Let me see if I want --

18 MR. ALEXANDER: Does he want it?

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20 BY MR. MORRIS:

21 Q If you have his deposition, if you
22 looked at Page 101 --

23 MR. BROWN: It's on a number of pages.

24 It starts well before that.

1 Q Okay. And what did you do to test that
2 account from Mr. Hodges?

3 A The other thing I used in doing that
4 was the video and looked at the flashes and where
5 those flashes originated. And so by using that with
6 his reaction, I determined that the explosion had
7 taken place in the duct -- in the bag house, not in
8 the ductwork, the initial explosion.

9 Q Did you consider Mr. Hodges' statement
10 to be reliable?

11 A Yes.

12 Q Okay. And what was that based on?

13 A Based on that he was there and seeing
14 it. I have talked to other people that have been
15 involved in them, in explosions and in flash fires,
16 and found them to be very reliable in what they
17 remember. It may be something as easy as they saw,
18 you know, bright orange flash coming out of a
19 55-gallon drum and landing 30 feet or 40 feet away
20 from the -- but they remember where the origin and
21 what they saw.

22 Q Okay. And when Mr. Hodges stated that
23 he could see that the fireball originated beyond the
24 damper, or the flue or whatever he called it, okay,

1 the area where the plaintiffs were working.

2 A That could have been just by the
3 vacuum. It could have been by the flow.

4 Q Okay.

5 A I guess any material flowing through a
6 pipe like that is going to cause a static buildup.
7 Just different materials dissipate it differently.

8 Q But you indicated previously that
9 that -- that the creation of the static electricity
10 and generation of sparks was a potential source of
11 ignition for combustion and explosion in this case?

12 A In -- it's a source of sparks and
13 having air going through a PVC pipe, yes, anything
14 that's ungrounded. Even ungrounded or unbonded steel,
15 you can still have the same issues.

16 Q Okay. Now, with respect to the
17 explosion itself, in your report you indicate that the
18 number one fact that you relied upon here was the
19 testimony of Mr. Hodges that he saw an explosion in
20 the bag house; is that correct?

21 A He saw a fireball coming down the
22 ductwork. He said he could see past the backdraft --
23 or backblast damper into the elbow, and he saw the
24 fireball originate from that point.

1 A No.

2 Q Are you aware whether or not flexible
3 hose is manufactured so that it does have grounding
4 material in it?

5 A Yes, it does.

6 Q In this case there is nothing to
7 suggest that this flexible hose had any grounding
8 material in it, correct?

9 A I have no information on that.

10 Q And then we get to the PVC pipe, or the
11 lance as you referred to it. And was the use of PV --
12 is the use of PVC pipe in cleaning aluminum dust
13 ventilation systems appropriate?

14 A It's nonconductive. So in anything
15 that's combustible dust, you need to use conductive
16 materials. PVC is not conductive, and I don't know of
17 anything that's commercially available like that that
18 is conductive.

19 Q Is it nonsparking?

20 A It will -- it will not transfer a
21 spark. A spark will build up on the surface of the
22 PVC, but it's not going to release a spark.

23 Q And, in fact, in this case the
24 information we have is that it did generate sparks in

1 be conductive nonsparking material? Is that --

2 A Yes.

3 Q -- part of NFPA requirements? In this
4 case, we had the vacuum truck, which we have already
5 discussed. And then from that there was aluminum pipe
6 that was attached to the vacuum truck, correct?

7 A Yeah, per my understanding and the
8 pictures.

9 Q Would that aluminum pipe fit those
10 requirements?

11 A Yes.

12 Q Okay. The flexible hose that was used
13 here?

14 A There are flexible hoses that are
15 conductive. I don't remember exactly whether the hose
16 that was used at this point was conductive material or
17 nonconductive construction.

18 Q You had an opportunity to see --

19 A I saw it.

20 Q -- that hose?

21 A I took a picture of it and was more --
22 looked at the lance and the PVC there.

23 Q The flexible hose that was used, do you
24 know whether or not that was grounded in any way?

1 reporter, please wait until I finish my question
2 completely before you start your answer. I will do my
3 best to extend you the same courtesy and allow you to
4 finish your answer completely before I move on. If at
5 any time you feel that you have not finished your
6 answer, please let me know, and we will make sure that
7 we get a complete record and one that we will all be
8 able to read for the benefit of our reporter, okay?

9 A Thank you.

10 Q We were discussing the vacuum truck
11 previously and the equipment that was being used by
12 the plaintiffs in their cleaning operation. You
13 mentioned a few things, so I just want to go through
14 the equipment that was being used in terms of the
15 bonding and grounding of the equipment.

16 With respect to the cleaning of ducts
17 involving aluminum dust ventilation system, would you
18 agree that you should use grounded and nonconductive
19 equipment?

20 A Yes. NFPA requires that all of the
21 ductwork, both in that type of system, a vacuum
22 system, a dust collection system, be grounded and
23 bonded.

24 Q And that whatever is being used should

1 going across that in that vacuum truck, going in the
2 ductwork, not in the vacuum truck.

3 Q Okay. And we do know that there was a
4 fire or some type of explosion within the vacuum truck
5 itself, correct?

6 A Which -- yes.

7 Q And that's not revealed on the video as
8 to when that occurred?

9 A No.

10 Q And we have no eyewitness information
11 as to when that occurred in relation to any other --

12 A Not that I am --

13 Q -- event of the explosion?

14 A -- familiar with.

15 MR. MORRIS: I apologize. Can we take
16 a quick break?

17 MR. BROWN: Sure.

18 THE VIDEOGRAPHER: Off the Record.

19

20 (A recess was taken.)

21

22 BY MR. MORRIS:

23 Q Mr. Schloss, continuing on -- first,
24 before we go further, at the request of our court

1 you -- are you aware of that?

2 A No. It may have been in deposition,
3 but I don't recollect it.

4 Q Next question: So the only operating
5 machinery that we have in this closed system is the
6 vacuum truck, correct?

7 A Yes.

8 Q Okay. And in your analysis, you -- you
9 didn't ask for any information or did not find any
10 information as to any safety procedures in terms of
11 grounding the truck and/or the system that were taken
12 with respect to the vacuum truck, correct?

13 A No. The vacuum truck -- the vacuum
14 truck itself is intrinsically safe. The ductwork and
15 everything that's hooked up to it would be hard --
16 would be hard to ground in that you have hose, you
17 have PVC hose, and PVC pipe that you are using as a
18 wand. So you would not have a continuous bonded path
19 from the time you are collecting it until the time you
20 are getting to the vacuum truck.

21 Q Does that create --

22 A It creates --

23 Q -- any additional risk of --

24 A It can create a potential of a spark

1 THE WITNESS: The system grounded or
2 the vacuum truck grounded?

3
4 BY MR. MORRIS:

5 Q Well, two things that -- we will go
6 through that. First of all, there has been testimony
7 that there was no grounding of the truck itself, okay?
8 What grounding of the system are you referring to?

9 A The grounding of the piping and
10 everything off of the vacuum truck, from the vacuum
11 truck out.

12 Q And in your investigation, is there any
13 information that you have that any of the equipment
14 that was connected to the vacuum truck was grounded?

15 A No.

16 Q Okay. So we haven't -- so the truck
17 isn't grounded and the system isn't grounded; is that
18 correct?

19 A Well, if the -- I don't understand the
20 truck not being grounded.

21 Q There has been testimony that there is
22 a specific method that they use in order to ground the
23 truck, that they can take a ground wire and attach it
24 somewhere. That was not done in this case. Were

1 points between the air that's being brought into it
2 and the air outside?

3 A No, because the friction that you are
4 going to -- the friction of sucking through all those
5 devices is going to heat that air up quite a bit. You
6 are going to end up with about a 2 degree rise for
7 every horsepower that those vacuums pull.

8 And the vacuum truck itself are
9 intrinsically safe, which means they are grounded,
10 bonded, everything. It by itself is a safe operating
11 -- if that wasn't true, you would be blowing up a lot
12 of vacuum trucks.

13 Q All right. And did you read in the
14 deposition transcripts in this case that the vacuum
15 truck was not grounded at the time of its operation at
16 Federal-Mogul?

17 A I did not read that.

18 Q Okay. And so --

19 A But, again, being grounded as the --

20 Q Mr. Schloss, I am going to --

21 A -- truck or the system being grounded?

22 MR. BROWN: He can answer the question.

23 MR. MORRIS: He did answer the

24 question. He went beyond my question.

1 A The vacuum truck, in my professional
2 experience, is a very safe device by itself. It's
3 only when you start hooking things up to it. So the
4 vacuum truck actually creating and originating the
5 explosion in the vacuum truck I ruled out.

6 Q Okay. Well, my first question was:
7 Did you consider it as a potential source of ignition
8 for the explosion that occurred in this case?

9 A Yes.

10 Q Okay. And the vacuum truck,
11 essentially, is similar to a bag house in that you are
12 pulling the dust and debris into a collection system,
13 correct?

14 A Yes.

15 Q And as part of this operation, we have
16 a closed system between the bag house, the ductwork,
17 the --

18 A Yes.

19 Q -- PVC pipe, the flexible hose, the
20 aluminum pipe, into the vacuum truck, correct?

21 A Yes.

22 Q The vacuum truck is outside similar to
23 the bag house. Would that be subject to the same
24 situation in terms of the difference between dew

1 factor? Was that the factor that -- of an
2 explosion? I don't see it.

3

4 BY MR. MORRIS:

5 Q Is it fair to say that in evaluating
6 all the potential causes of the explosion here that
7 eventually you came down to two possible causes, one
8 being the generation of the static electricity by the
9 use of the PVC pipe by the plaintiffs, or, as you
10 mentioned earlier, an exothermic reaction in the bag
11 house?

12 A Yes.

13 Q And you were able to eliminate every
14 other cause at that point?

15 A I'd have to go back through that list
16 of what I gave you, but, I mean, that was really --
17 really, at that point it came down to the video and my
18 opinion or my interpretation of the video of which
19 flashes were the bag house exploding and what flash
20 was the stuff coming back down the ductwork.

21 Q Now, did you consider -- just consider
22 as part of your evaluation here whether or not the
23 vacuum truck could have been a potential source of
24 ignition for this explosion?

1 A No. I looked at -- you know, looked at
2 the devices, you know, looked at a piece of PVC pipe
3 and the hose and the duct and how they had it all
4 hooked together and, you know, you can generate a
5 spark --

6 Q Okay.

7 A -- with the --

8 MR. BROWN: Excuse me. Let him finish
9 his answers. Please don't talk over him.

10 THE WITNESS: You can generate a spark
11 in it. Whether every other condition was
12 there at the time of the spark is really --
13 you know, again you are vacuuming something
14 in, so you are not generating a dust cloud.
15 You are sucking the dust cloud into it. You
16 are vacuuming, you know, the -- you are
17 vacuuming, you know, where the PVC will flow
18 through any type of -- any type or any type
19 of material is going to cause a static
20 buildup. PVC is not recommended to use for
21 that. You know, yes, there was things that
22 were not safe that were going to generate
23 sparks or less safe than they could have
24 been, but was that, you know, a contributing

1 your --

2 A Yeah.

3 Q -- prior investigations and otherwise,
4 that had they been following proper safety procedures,
5 you could have eliminated that as a cause; is that --
6 is that fair?

7 A You can never eliminate a hundred
8 percent of the risk of doing something like that even
9 safely, you know, following every safety procedure.

10 I have a chemical plant that I do work
11 in that had six people clean out a dust collector, a
12 welder strike an arc, and get burned across the faces.
13 You know, they met every one of their safety
14 requirements. They had everything -- he had the
15 proper PPE on. Luckily, it didn't burn his eyes, but
16 burned the hair off of his face.

17 Q And in this case, did you evaluate all
18 of those things as well?

19 A I was told about it. I didn't evaluate
20 that. It was for a customer that I was doing some
21 work with and an --

22 Q No, no, in this case.

23 A -- incident they talked about.

24 Q I understand.

1 A -- cause that has to be considered in
2 my evaluation.

3 Q And as part of that analysis, you have
4 to look at what equipment is being used?

5 A Yes.

6 Q And what potential there is for that
7 creating a -- an environment in which there could be
8 an explosion, correct?

9 A Yes.

10 Q And in this instance, in looking at
11 that and determining whether or not the equipment that
12 was being used for the cleaning of the aluminum duct,
13 did you reach any opinions as to whether or not that
14 was a potential cause?

15 A It was potential cause of -- what they
16 were doing could cause an explosion, yes. In terms of
17 if you isolate just that one part of it, yes, that
18 would --

19 Q But that's part of your analysis?

20 A Yeah. If you isolate and say they were
21 taking a piece of PVC and putting it -- hooked to a
22 vacuum truck, putting it into aluminum, there is a
23 cause there that you are going to generate sparks.

24 Q And based on your experience and

1 was. And you would agree with me, as we said before,
2 that you have to go through all possible causes and
3 eliminate them through scientific --

4 A Yeah.

5 Q -- methodology pursuant to NFPA 921,
6 correct?

7 A Yes.

8 Q Okay. One of those causes could be the
9 actions of the workers in this case. Could be,
10 correct?

11 A It was generating sparks and --

12 Q Okay. Just -- will you agree with
13 me --

14 A If you want me to stop right there,
15 that that's as far as you want me to go --

16 Q I want you to answer my question right
17 now.

18 A Okay.

19 Q My question is: The actions of the
20 plaintiffs, of the LCM employees, that is a potential
21 cause that has to be considered in your evaluation
22 of --

23 A That is potential --

24 Q -- this explosion?

1 potential causes for the explosion.

2 Q And can the failure to follow proper
3 safety procedures be a contributing cause to an
4 explosion?

5 A How about rephrase the question?

6 Q Sure. Do you need to eliminate the
7 improper use of equipment or a failure to follow
8 necessary safety procedures as a cause of an
9 explosion?

10 A I look at what they were doing as a
11 cause of an explosion. How they picked them and the
12 decision that they made to pick those types of devices
13 doesn't really matter. It's -- it's what was
14 physically being done at the time of the explosion.

15 Q Okay. And in this particular instance,
16 did you reach any opinion as to whether or not the
17 actions of the plaintiffs could have caused or
18 contributed to the explosion that occurred?

19 A I don't -- in my professional opinion,
20 it didn't contribute to the explosion in the dust
21 collector.

22 Q Not my question.

23 A Okay.

24 Q I understand what your final opinion

1 Q Well, in evaluating the potential
2 causes of an explosion, would one of the factors be
3 what the individuals were doing and whether or not
4 they were taking appropriate safety procedures before
5 you reach your final opinion?

6 A Before -- I looked at what they were
7 doing, not what they were trained to do. I looked
8 at --

9 Q Okay. Well --

10 A -- devices they were using on the
11 cleaning when we did the field -- looked at it in the
12 field and looked at the devices they used and the hose
13 and tubing and things like that. I looked at those.
14 I did not look at whether they were trained in -- they
15 may have been trained, and that's the decision they
16 made to use those equipment. It doesn't necessarily
17 mean training equals results.

18 Q And for the purpose of this question, I
19 am not asking about their training. I am asking about
20 actually what they were doing and whether or not they
21 followed proper safety procedures, if that's a factor
22 that you would consider in evaluating the potential
23 causes for this explosion.

24 A I evaluated what they were doing as

1 Q I understand. But based on your
2 experience where you have evaluated explosions and you
3 have trained people on how to work around these types
4 of systems --

5 A If I was contracted with LCM, I
6 would -- I would have evaluated their systems. And if
7 they were deficient, I would have made the
8 recommendations to do the training.

9 Q Did you read in the deposition
10 transcripts that the supervisor of the job was aware
11 that aluminum dust was the product in the system they
12 were cleaning? Do you recall that?

13 A Yes, that it was -- aluminum dust was
14 the product. Whether he realized that aluminum dust
15 was combustible, I didn't see that.

16 Q Okay. And if he testified that he was
17 not aware that aluminum dust was combustible, do you
18 have an opinion as to whether or not that is a safe
19 procedure for LCM to proceed in cleaning the ducts at
20 Federal-Mogul?

21 A Well, really, I am not here to evaluate
22 what LCM did, you know, and -- you know, and whether
23 they trained their people onto it. I can only look at
24 the results of what that was.

1 very strong about teaching of -- training of your
2 employees.

3 Q And have you evaluated Federal-Mogul's
4 training procedures for its employees relating to the
5 aluminum dust ventilation system?

6 A I have seen in Federal-Mogul's
7 combustible dust management guidance and the
8 management program where they talk about that. I have
9 looked at what -- what's available at that point, but
10 no farther than that.

11 Q Okay. And what about LCM? Did you
12 evaluate their --

13 A No.

14 Q -- procedures with respect to working
15 on an aluminum dust ventilation system?

16 A No.

17 Q And why not?

18 A My understanding from reading the
19 depositions, I guess, was is that they were not
20 advised of the risk of aluminum combustible dust. The
21 actual workers that were on the platforms were not
22 advised of combustible dust. Again, whether LCM is,
23 you know, negligent at that point or liable for that
24 point, I am not here to talk about that.

1 A More likely than not.

2 Q -- the function of the system, it was
3 able to handle those small explosions if it did occur?

4 A But you don't design for small
5 explosions.

6 Q That's not my question at this point.
7 I understand --

8 A That's my answer. That's my answer at
9 this point is is you can have explosions in anything
10 that's not going to result in the damage or even
11 triggering any, you know, explosion protection device.
12 It depends on what the dust is at that moment, what
13 the ignition source is at that moment, how much
14 dispersion you have at that moment, how much volume of
15 material you have. All those things together are
16 going to determine how strong of an explosion do you
17 get.

18 Q And would you agree with me that when
19 you are working with an aluminum dust ventilation
20 system, that whoever is working on that should be
21 aware of the risk of explosion in a system of that
22 type?

23 A Federal-Mogul is required to teach
24 their people the risks around that. I mean, NFPA is

1 going to burn anything. You can get exothermic
2 reaction of a bigger pile of dust, and it may catch it
3 on fire.

4 Q I understand that. I understand that,
5 but what -- if I understand what you have told me is
6 that there could have been prior exothermic
7 reactions --

8 A There could have.

9 Q -- in the bag house that resulted in
10 smoldering and then, for whatever reason, fizzled out
11 or stopped.

12 A Yes.

13 Q Because if it continued, we would have
14 seen something else occur. There could have been
15 exothermic reactions that led to a small explosion
16 that went undetected because no one was in the area to
17 see it, hear it, or --

18 A And not be --

19 Q -- know it happened?

20 A And not be strong enough to activate
21 the explosion vents.

22 Q Right, okay. So all I am saying is
23 that if that occurred, and you say that's a
24 possibility that it did occur, that in terms of --

1 BY MR. MORRIS:

2 Q I will adopt probability.

3 A I have been in a plant that did shot
4 blasting, and I asked and said, Have you ever had an
5 explosion? They said, No, but every now and then our
6 dust collector goes plump and the sides pulse out.
7 You know, have they been having explosions? Yes.
8 They just didn't have one at a high enough degree that
9 was going to cause the thing to rip apart or, you
10 know, the vents to actuate. You could have had
11 exothermic reactions for all those seven years that
12 would have went undetected and not cause an explosion.
13 It could have been the first time in seven years there
14 was an exothermic reaction.

15 Q So based on that then, in terms of the
16 explosion containment of that, if that did occur, then
17 the system operated properly on those prior occasions,
18 correct?

19 A No. I mean, no, because it may not
20 have met -- it may not have resulted in an explosion.
21 It may not have resulted in a fire.

22 Q Well --

23 A You can have exothermic reaction of a
24 small pile of dust that's sitting there, and it's not

1 things line up that's going to happen. A lot
2 of bag houses explode for no apparent reason.
3 Why did they explode that day versus 40 years
4 prior to it? You know, a lot of times there
5 is no real definite answer and say, well, it
6 blew up this day because of this and it blew
7 up this day -- you know, why didn't it do for
8 the last 40 years? So it -- all those things
9 have got to come together at one time.

10
11 BY MR. MORRIS:

12 Q And I understand that. That's why I am
13 asking you -- you can't say to a reasonable degree of
14 engineering certainty as to why it did not occur on
15 any other prior day, even though the same conditions
16 may have been present?

17 A It may have --

18 MR. BROWN: Before you answer, form of
19 the question objection. You asked about
20 engineering certainty, and that's certainly
21 not what the standard is. It's probability.

22 MR. ALEXANDER: Reasonable degree of
23 engineering probability.

1 opinion that the conditions for an exothermic reaction
2 and the other -- as an ignition source and the other
3 elements that would lead to an explosion were present
4 in that bag house?

5 A Yes.

6 Q All right. And as you sit here today,
7 you cannot give an opinion with a reasonable degree of
8 engineering certainty as to why an explosion would not
9 have occurred on any day prior to this?

10 A Well, it really depends on if the
11 equipment -- if the dust collector itself is running,
12 is operating. You are moving warm air across the
13 steel, so you have less condensation. If it's
14 running, you know, it's -- an explosion is a perfect
15 storm. All those things have got to come together.

16 Q Well, let me --

17 MR. BROWN: Excuse me, he is not
18 finished answering yet.

19 MR. MORRIS: I think he is going beyond
20 the question. That's why -- so --

21 MR. BROWN: He is entitled to finish
22 his answer.

23 THE WITNESS: I think an explosion is a
24 perfect storm. You have to have all these

1 exothermic reaction then isn't dependent on additional
2 water. Once it starts that reaction, it's going to
3 keep heating itself. It's all self-contained.

4 Q Okay. Well, then, based on what you
5 have told us so far, when this ventilation system
6 started operating back in 2003 or so and you had those
7 conditions, are you saying that an exothermic reaction
8 very likely would have started back in 2003?

9 A If you have the same situation that you
10 have there that day, that's very possible or, in my
11 opinion, would happen.

12 Q Okay. Well --

13 A In my opinion, you would have that
14 same -- whether it would have resulted into a fire or
15 an explosion really would have been dependent on the
16 material in the bag house.

17 Q I think that's obviously where we are
18 going to get to next is -- and, again, the ignition
19 source we come to is why on this day was there a
20 confluence of factors that occurred here. And I am
21 not asking the question yet, but that's obviously
22 where I am going.

23 Previously, based on your testimony and
24 based on the conditions that were there, is it your

1 set it down, pretty soon the water starts condensing
2 on the outside of it and going -- running down the
3 sides of your Coke can. Okay.

4 Take the same Coke can when it's 20
5 degrees outside, and the water does not form because
6 the temperature of the Coke is higher than the dew
7 point temperature of the air around it.

8 Reversing that and putting the moisture
9 on the inside of the bag house in a cold skin
10 temperature with steel that has very rapid temperature
11 exchanges, you are going to have a -- the bag house is
12 going to cool very quickly down to that outside
13 temperature and then the dew point, and you are going
14 to start having sweating on the inside of that bag
15 house. It can sweat on the bags. It can sweat on the
16 sides, in the hoppers.

17 Q If -- if the bag house is shut down for
18 an extended period of time, for more than the up to
19 hour and a half that we have here, let's say 24 hours,
20 48 hours or longer, does that affect the -- that
21 situation with the condensation?

22 A Once the condensation is into the
23 material, in the case with metal, as in aluminum, you
24 are going to start exothermic reactions. That

1 A Depending on the -- one, if the bag
2 house is operating, and two is is what the outside
3 conditions are. If the bag house is not operating
4 or -- or if it's cold outside, depending on what the
5 outside temperature and the dew points are, you will
6 start to condense on the inside of the bag house.

7 A lot of processes that are in
8 metal-producing plants, you insulate the bag house to
9 keep that transfer from happening so that you don't
10 end up with the skin temperature dropping below the
11 dew point temperature and condensing water into it.

12 Q Okay. And what if -- okay. Is there
13 any similar type of situation that would occur when
14 the temperature outside is hotter than it is inside?

15 A No.

16 Q Okay. So the difference in dew
17 point -- you could have a difference in dew point --

18 A Two things. One is the outside
19 temperature, which is going to determine what the
20 temperature of the steel in the bag house is and what
21 your inside humidity is on the -- on the bag house.

22 To use an example, if you have a Coke
23 can in the middle of the summertime, and the Coke is
24 40 degrees inside the can, you walk outside and you

1 have any effect on the amount of -- or will that have
2 any effect on the dew point for the interior of the
3 Federal-Mogul plant?

4 A Over time it would. In that amount of
5 time, I don't think you would see -- my personal or my
6 professional opinion is you wouldn't see much of a
7 change in it. Again, too, by having that
8 water-producing equipment, it was producing water
9 while it was running as well. So the dust collector
10 would have been seeing that moisture over an extended
11 period of time.

12 Q So, again, that -- whenever it was
13 operating over the seven years before, you are
14 indicating that there would have been moisture in the
15 air that was being transported into the bag house?

16 A Yes.

17 Q Is that correct? Okay. And that the
18 moisture that's being transported, if it's shut down
19 for a short period of time, such as a half an hour to
20 an hour and a half, would have no effect on the
21 moisture being transferred to the bag house? That's a
22 bad question. Let me withdraw that. Let me ask
23 another question. The -- the water vapor that gets to
24 the bag house, what happens to it when it's in there?

1 Q -- just the production line that was
2 for the aluminum dust, that created the aluminum dust?

3 A My understanding was -- again, I didn't
4 check to see if the rest of the plant was running. My
5 interest was in the lines that were served by that
6 dust collector. And if you were running the process
7 -- if you were running the dry dust collectors, you
8 would have to be running the wet dust collectors to
9 handle another part of this same production line. So
10 my assumption was is that since both of them were
11 running at that -- required to run, that it would be a
12 requirement that both the dust collector and the wet
13 dust collector would be running. And, again, that's
14 based on how the system is currently designed or --
15 and what was specified in Federal-Mogul's design
16 documents.

17 Q Okay. And based on your prior answer,
18 it's your understanding that that particular line, the
19 aluminum dust ventilation system, including the water
20 vapor-producing equipment, had been shut down between
21 a half hour and an hour and a half before LCM started
22 its work?

23 A Yes.

24 Q The fact that it's shut down, does that

1 Q Okay. Have you done any testing or
2 created any models to determine the extent to which
3 that particular equipment in the Federal-Mogul plant
4 would raise the dew point or increase the relative
5 humidity for the plant air?

6 A No, but I know how to do it. I do it
7 as part of my business. I just did not do it in this
8 case.

9 Q So, as you sit here today, can you
10 provide any basis for -- withdrawn. Can you tell us
11 what the dew point was for the Federal-Mogul plant
12 inside the plant on December 31 of 2010?

13 A No.

14 Q Do you know whether or not the water
15 vapor-producing equipment was operating at
16 Federal-Mogul on that day?

17 A I have been told that it was.

18 Q Okay. Told by who?

19 A Again, when I asked the question was
20 the plant operating, they said up to the time when it
21 was shut down to start cleaning the ductwork.

22 Q And when you say the plant being shut
23 down, is that the entire plant or --

24 A No, the process.

1 vapor into the plant.

2 Q Is there any way to test that?

3 A Yes.

4 Q How would you test that?

5 A You can test versus the outside. You
6 take a measuring device that's going to measure
7 temperature and wet-bulb temperature or temperature
8 and absolute humidity. There is different devices
9 that you can tell how much moisture is being added.

10 Q And for this case, did -- did you do
11 any type of model or any type of testing -- well,
12 withdrawn. Let me ask you this first: Are the water
13 vapor-producing equipment that you referred to still
14 operating at Federal-Mogul?

15 A The understanding I had was the plant
16 was running at -- up until the time it was shut
17 down --

18 Q I'm sorry to cut you off. Not that
19 day. I am talking about after the explosion and when
20 you got the request to do your review in this case.
21 Do you know, as of today or at any time since you have
22 had it, whether or not that equipment is still being
23 used?

24 A I don't have any direct knowledge.

1 were all installed at the same time for this
2 production line, would mean there would be vapor --
3 free water vapor in the air.

4 Q Okay. And that would be for the entire
5 plant?

6 A Well, I mean, you would have just in
7 the -- I looked at just the area of where they were
8 doing the production side of it.

9 Q Okay. With respect to the water
10 vapor-generating equipment, okay, does that raise the
11 relative humidity of the air for the entire plant?

12 A Yes. Relative humidity is a number
13 that says just exactly what it is. It's relative to
14 how much moisture does it have versus how much
15 moisture can it have. So what it was actually doing
16 was raising the entire dew point of the plant.

17 Q Didn't you do any calculations for the
18 extent to which the dew point was raised in the
19 plant --

20 A No.

21 Q -- as a result of this equipment?

22 A Other than my experience with wet dust
23 collectors is you are putting water vapor into the
24 plant. You have got employees that are putting water

1 Q Or whether it was actually done?

2 A That was outside of the scope of what I
3 was looking at.

4 Q You mentioned specifically water
5 vapor-generating equipment in the plant?

6 A Yes.

7 Q Where did you get information about
8 that subject?

9 A From the proposal -- or from
10 Federal-Mogul's specs on the original project, it
11 required two dry dust collectors and then two wet dust
12 collectors for the process, a different part of the
13 process. A wet dust collector works by either
14 spraying water into the air to take out the
15 particulate or by running the air through a tank and
16 through a bath to remove the particulate as well.

17 Q Okay.

18 A There was talking about -- then their
19 specifications also had a sludge-handling equipment,
20 which meant what was coming off of the dust collector
21 is going to be a mixture of both particulate and water
22 that's going to come out wet to be dried.

23 So just the inclusion of those two
24 pieces of equipment in the general area, because they

1 procedures of the workers?

2 A When I teach it and teach safe
3 operation of dust collectors, lockout/tagout is a big
4 issue in it.

5 Q Okay. And are you familiar that with
6 lockout/tagout that it's the individual working on the
7 equipment that's responsible for making sure that's
8 done? Are you familiar with that standard?

9 A Yes. And I don't know who locked out
10 what or how many locks were on it.

11 Q Okay.

12 A Or what Federal-Mogul's internal
13 procedures are or requirements.

14 Q Let's see. Now, this may be similar,
15 but the operational condition of the plant, I guess
16 that -- we are talking about the same thing, either --
17 whether that's the machines or the dust collection
18 system. And, again, you were just provided the
19 information that there was a lockout and tagout, but
20 you are not -- you don't have any information as to
21 whether or not that was checked by the plaintiffs?

22 A No.

23 Q Or who did it?

24 A That was outside the scope --

1 Q -- and were told either by plaintiffs'
2 counsel or --

3 A Either in deposition or that it was
4 locked out and tagged out. That was also part of
5 LCM's proposal is that the lockout/tagout would be by
6 Federal-Mogul.

7 Q And while we are talking about
8 lockout/tagout, are you offering any opinions with
9 respect to the safety procedures followed by the
10 plaintiffs or LCM in their work here?

11 A No, other than I know, you know, safe
12 work around the -- around combustible dust. I teach
13 it. I do seminars on it.

14 Q So, for example, Mr. -- I want you to
15 assume Mr. Hodges testified at his deposition that he
16 did not check to see whether or not the Federal-Mogul
17 equipment was locked out or tagged out or whether the
18 bag house -- the dust collecting system had been
19 locked out and tagged out. You are not here to offer
20 any opinion as to whether that's proper procedure or
21 otherwise; is that correct?

22 A I have no information on that.

23 Q Okay. Is that something that would be
24 within your expertise, to evaluate the safety

1 I have seen between a half hour and an hour and a
2 half.

3 Q Do you remember where you got that
4 information from?

5 A No. It could have been provided by
6 counsel.

7 Q In what form? By --

8 A Just asking a question and statement.
9 Or it may have been in one of the depositions. I am
10 not sure.

11 Q But did you do anything to verify that
12 other than either being told by counsel or maybe
13 reading it in one of the depositions?

14 A No. I didn't contact the plant or
15 anybody at that point. I requested -- I mean, I
16 requested that information, and that's what I was
17 told.

18 Q I guess the other one similar to that
19 was whether or not the dust collector system was
20 operating at the time, correct?

21 A Yes.

22 Q Okay. And that's information that you
23 asked was it on at the time --

24 A I have seen that --

1 go through and eliminate the potential sources of
2 ignition, correct?

3 A Yes.

4 Q And when you do that, do you have a
5 process whereby you go through eliminating the least
6 likely to the most likely? Or do you go most likely?
7 Do you have a process to do that?

8 A I look at what the impact of each one
9 of them would be and whether that was available, you
10 know, that -- like say the process equipment, whether
11 it was running or not. If it's not running, then
12 that's -- eliminates it as a source. I look through
13 each one of them equally to make that decision.

14 Q So based on the list that you gave me,
15 it's fair to say that there were some that you easily
16 eliminated as a source of ignition?

17 A Yes.

18 Q First being the Federal-Mogul equipment
19 because, based on the information provided to you,
20 that equipment had been shut down that day, correct?

21 A Uh-huh, yes.

22 Q And do you know how long it had been
23 shut down for prior to the work on the ductwork?

24 A I was told anywhere from a half hour --

1 A If they were -- if there was a reason
2 as a flashlight breaking or any source -- external
3 source of electrical spark.

4 Q Okay.

5 A If the dust collectors were operating,
6 which I am told they were not, that they were
7 electrically locked out. Again, the type of material,
8 the aluminum dust.

9 Q Okay. Anything else?

10 A The condition of settling in the
11 ductwork of the aluminum dust. You know, if there was
12 an ignition source from the process equipment, which I
13 am told was locked out.

14 Q When you say process equipment, you
15 mean the Federal-Mogul equipment?

16 A The Federal-Mogul equipment, not the
17 dust collection. NFPA will tell you ignition sources
18 are free. You can never design all the ignition
19 sources out of a system. You could have a short
20 circuit. You can have lightning come in on it. There
21 is a lot of different sources of ignition.

22 Q Understood. And --

23 A Exothermal.

24 Q Sure. And part of your process is to

1 documents, did you have various possible causes that
2 you were considering?

3 A Yes.

4 Q And can you tell me what causes you
5 were looking at or what sources of ignition you were
6 looking at as the cause of the explosion?

7 A When I looked at the entire system --
8 and, again, taking the video out of it, I looked at
9 the role of what the workers would have been doing.

10 Q When you say the workers, who are you
11 referring to?

12 A The three individuals that were
13 injured, the two --

14 Q The LCM employees, the plaintiffs, not
15 the Federal-Mogul employees?

16 A No, the LCM employees.

17 Q Okay. So you look at what were the
18 plaintiffs doing.

19 A What were the weather conditions, what
20 was the operational condition of the plant.

21 Q Okay.

22 A Was there water-generating or vapor --
23 water vapor-generating equipment in the plant.

24 Q What else?

1 operating. Is that fair?

2 A Based on that information, the
3 information provided, yes.

4 Q Based on the information that you have
5 had to reach your opinion, that's -- that's the key to
6 determining what the cause of this explosion was,
7 correct?

8 A Yeah. Yes.

9 Q Okay. And in determining what the
10 ignition source was, that would also help to determine
11 where the origin of the explosion was as well,
12 correct?

13 A Yes. Again, looking at the video --

14 Q Well, there is no question before you.
15 There is no question before you, so --

16 A That could be carrying off from the
17 last one, so...

18 Q Okay. So in terms of your
19 investigation of this incident, is it fair to say that
20 you came to a point where you had to focus on what was
21 the source of ignition for the explosion on December
22 31?

23 A Yes.

24 Q And at your initial review of the

1 was no.

2 Q Okay. So -- and again just to go back,
3 so the dispersion of the dust cloud was a condition
4 that would have been present on any day prior to this
5 as well, correct?

6 A Yes.

7 Q Okay. Containment. When you say
8 containment, what are you referring to?

9 A The dust collector itself.

10 Q And when you say the dust collector, is
11 that --

12 A The enclosure of the bag house.

13 Q So that's not the 55-gallon drum that's
14 at the bottom? Or is that part of it?

15 A It could be. It could be. If it's not
16 isolated, that's included in that volume as well.

17 Q Okay. And, clearly, that containment
18 system had been present since the system had been
19 installed and operated?

20 A Yes.

21 Q So the only -- only factor that we have
22 to consider is what's the source of ignition in terms
23 of what's different on this day to cause the explosion
24 than any other day that this system has been

1 is present on a daily basis in this system?

2 A Yes. And a dust collector is a perfect
3 product classifier. The heavy particles fall down
4 onto the -- into the hopper. The light particles go
5 up onto the bags. The filtration is actually provided
6 by a dust cake on those bags. It's like your home
7 furnace filter. About the time that you look at it
8 and it's all dirty, it's finally starting to work. So
9 at that point you -- using the dust is actually what's
10 providing the filtration efficiency on the dust. The
11 dust collector in normal operation is going to pulse
12 off that dust down into the -- into it, but, also, a
13 dust collector that's shut down will experience dust
14 falling off of the bags over a period of time.

15 Q So fair to say that the bags don't get
16 rid of everything while it's on?

17 A And they don't clean while it's --
18 while it's -- they don't completely clean when you
19 turn it off.

20 Q Okay.

21 A You can also end up with buildup on the
22 walls of the dust collector. And I think in one of
23 the depositions it was asked had the dust collector
24 ever been cleaned or the bags changed, and the answer

1 That's something that is present at all times and had
2 been present in this system every day, correct?

3 A Yes.

4 Q Okay. Fuel. In this case, what, in
5 your opinion, was the fuel for the explosion?

6 A The aluminum dust.

7 Q And, again, the aluminum dust was
8 something that had been present in the system since it
9 started operating some seven years earlier, correct?

10 A Yes.

11 Q And was there any difference on this
12 day in terms of the characteristics of the aluminum
13 dust in the system?

14 A I -- without, you know, analyzing the
15 dust, I would assume that the same equipment and their
16 process is the same day after day, and the dust is
17 going to be the same every day that goes into it. I
18 have no information of a process change that was made
19 prior to this or that had been made in the seven
20 years.

21 Q All right. I am going to skip over
22 ignition source for just a second because I know you
23 already mentioned the exothermic reaction there.
24 Dispersion of the dust cloud, is that a condition that

1 In the -- by having a dust collector
2 that's handling combustible metals, especially, it's
3 important that the dust collector not have
4 condensation on the inside of the dust collector.

5 Based on the weather data that I
6 reviewed as well as the fact that the plant has wet
7 dust collectors that will be adding moisture to the
8 air on the inside of the plant, that the probability
9 -- or, in my opinion, is is that the dust collector
10 was condensing. The material that was in there had a
11 exothermic reaction. The exothermic reaction caused
12 the explosion. And all of those things are
13 independent of what they were doing in the ductwork or
14 what somebody was doing on the other end of the plant.

15 Q Okay. Let's -- well, let's go through
16 what was present on that day. And I will ask this in
17 a -- I may ask this a couple ways. So if I say it in
18 a confusing way, please let me know.

19 A Okay.

20 Q I will rephrase the question, or we
21 will repeat it back so that we make sure that we are
22 talking about the same thing.

23 You said five things need to be present
24 for an explosion to occur. The first one is oxygen.

1 the explosion occurred on that day?

2 A Explosions don't really pick what day
3 they want to happen. It's a coming together of, you
4 know, multitude of things all at one time. Nobody
5 gets up and schedules one for 10 o'clock in the
6 morning. So it could have -- it could have happened
7 that day, and it could have went 40 more years without
8 running.

9 Q Okay. Well then --

10 A The length of time really doesn't --
11 the length of time that the equipment has been running
12 does not make it any safer. I have a lot of customers
13 that say, well, we have run 20 years without an
14 explosion. Say, well, yep, you ran 20 years without
15 an explosion, and you had one. What happened in the
16 first 20 years.

17 Q Well, I guess that's where I am going
18 next is, then what are the factors that need to be
19 present or were present on December 31, 2010, that, in
20 your opinion, brought about this explosion?

21 A To have an explosion, you need five
22 things: You need oxygen, you need fuel, you need an
23 ignition source, you need dispersion of the dust
24 cloud, and you need containment.

1 know, based on all of those things and where I
2 determined the explosion originate, it would have made
3 no difference if they were working on it or not
4 working on it.

5 Q Okay. Why is that?

6 A Because I don't think they had -- in my
7 professional opinion, the explosion didn't originate
8 at the employees. It originated in the dust
9 collector, and there was nothing that the employees
10 were doing that was going to change that fact or
11 contribute to it in the dust collector per my
12 findings.

13 Q All right. And this ventilation system
14 had been operating for approximately seven years --

15 A Yes.

16 Q -- prior to this day?

17 A Uh-huh.

18 Q Okay. Were there any conditions that
19 were present on December 31, 2010, that were different
20 than any other day that it had been operating up until
21 then?

22 A I don't have that information.

23 Q Okay. Do you have an opinion with a
24 reasonable degree of engineering probability as to why

1 Q Okay. If Mr. Hodges, Mr. Bonds, and
2 Mr. Spangler were not present cleaning the ductwork at
3 Federal-Mogul on December 31, 2010, would that
4 explosion have occurred?

5 A Could that explosion have occurred, or
6 would that --

7 Q I am asking first would that.

8 A It's possible that the explosion could
9 have occurred based on the information that I have
10 saw. The role that the employees played in that
11 decision -- or in that explosion, it's -- I would say
12 based on what I found, it could have exploded without
13 them being there. That's my -- my professional
14 opinion is, is from what I saw and working on
15 different dust collectors like that that there's a
16 possibility that that could happen.

17 Q Okay. So to put it another way, I
18 suppose -- well, let me go into another question with
19 that. Do you have an opinion as to whether or not any
20 of the actions taken by the plaintiffs that day in
21 cleaning the ductwork caused or contributed to the
22 explosion occurring specifically on that day?

23 A From my analysis of the explosion and
24 of the equipment and the videotape and the -- you

1 that correct? Are those two different things, or is
2 that the same?

3 A Yes, it's two different things.

4 Q All right. Let me ask you this
5 question: In -- I understand that this was a -- the
6 event took place on December 31 of 2010, correct?

7 A Per the information that I have been
8 handed, yes.

9 Q Okay. And that was at the
10 Federal-Mogul plant in Blacksburg, Virginia, correct?

11 A Per the information that I have been
12 provided, yes.

13 Q So my question to you is: Would this
14 event have occurred on December 31, 2010, whether or
15 not the plaintiffs were at the Federal-Mogul plant
16 that day?

17 A Can you clarify? I don't understand.

18 Q Sure. We know an explosion occurred on
19 that day, and we know that the three plaintiffs were
20 there for LCM cleaning the ductwork. My question is:
21 Was -- would that explosion have occurred on December
22 31, 2010, whether or not the plaintiffs, as LCM
23 employees, were there cleaning the ductwork that day?

24 A Try one more time.

1 been a component in making those decisions. But
2 looking at the actual equipment that as it was
3 destructured, it wouldn't have changed my opinion of the
4 designs.

5 Q Okay. And, again, I am trying to
6 separate two parts out here, because part of your
7 opinion seems to be that the ventilation system
8 itself -- that you were reviewing its design at the
9 outset.

10 A Uh-huh.

11 Q Whether it was capable of performing
12 the functions that it was intended to do at that time;
13 is that correct? That's one aspect?

14 A Based on the information that was
15 available.

16 Q Okay.

17 A Publicly available at that time.

18 Q All right. The second thing that you
19 are referring to here is looking at the event of the
20 explosion itself.

21 A Yes.

22 Q And whether or not the component parts
23 that had been selected as part of that design were
24 appropriate based on that event and what occurred; is

1 information to make a determination is, was the
2 information that would have been available at the time
3 that the equipment was selected, if that was -- if the
4 equipment was selected for that -- you know, based on
5 that information or also reviewing the explosion is
6 did a higher pressure or a higher Kst did the
7 equipment experience in the explosion.

8 Q Is it fair to say that if you had that
9 information, you could give a more precise or a more
10 certain opinion with respect to the design of the
11 ventilation system?

12 A It would have been part of making the
13 analysis of it, but it wouldn't have changed the
14 outcome of my opinion.

15 Q Okay. Why not?

16 A Because the equipment -- the
17 destruction of the equipment indicated that the -- in
18 the case of the dust collector, that the vent weren't
19 properly -- or weren't large enough to release the
20 vents, and the dust collector tore itself apart or had
21 structural failure. In the case of the back blast
22 damper, it structurally failed due to the pressures.

23 Again, that doesn't -- changing --
24 changing knowing what the dust going into would have

1 the application.

2 Q And since that information is not
3 available, does that have any impact on your certainty
4 or your opinion as to what you have expressed in your
5 report here?

6 A It has had an impact in what was the
7 final -- or the initial design information to -- and
8 by -- let me get my thoughts together here.

9 Q Well, let me see if I can ask it more
10 specifically. You said one of the things that you
11 were reviewing was the design of the system itself.
12 How would knowing the composition of the dust affect
13 your opinion in this case on the design of the system?

14 A It would determine if the dust
15 collection equipment and the dust collection system
16 was capable of withstanding the pressures and the
17 selection of the equipment would react fast enough for
18 the type of dust that was -- it was asked to filter.

19 Q And without that information, were you
20 able to reach an opinion as to the design of the
21 system?

22 A Based on the destructive forces that I
23 observed on the equipment -- and, again, this is based
24 on -- this is what I do all the time. Backed into the

1 A Minimum ignition energy that it would
2 take to ignite it, minimum explosive concentrations,
3 things that you would use to analyze the dust and the
4 proper selection of the equipment.

5 Q For the ventilation system itself?

6 A For the ventilation system itself,
7 including the dust collector, ductwork.

8 Q And why would that be important to your
9 final opinion?

10 A To determine the cause of the
11 explosion; determine the severity of the explosion in
12 the dust collector, in the backdraft damper, and in
13 the ductwork; to determine the origin of the explosion
14 as well as severity of the dust cloud that was -- or
15 the gasses that were given off by it.

16 Q And, again, so you are referring to
17 dust that was collected in the ductwork itself as well
18 as the dust that was present in the bag house at the
19 time?

20 A Yes. The reason that is is to properly
21 select the equipment and the explosion protection, you
22 have got to know the numbers of the Kst, which is rate
23 of pressure rise over rate of time, and pressure
24 maximum to decide the selection of the equipment for

1 Q And can you explain to me what you mean
2 by dust testing of the aluminum dust?

3 A The dust test would have been provided
4 by a company similar to Chilworth, Fenwal, where they
5 actually run the chemical characteristics and have --
6 explode the dust to measure what the rate of rise of
7 the pressure over time, ΔP over ΔT , which is
8 used in calculating K_{st} , and also P_{max} , which is the
9 maximum pressure involved in the explosion.

10 I was told that the dust had not been
11 tested prior to that, that there was dust that --
12 there was dust samples available. But due to the time
13 since the explosion, unless it was really tested prior
14 to the explosion, anything after that point wouldn't
15 give you an accurate representation of what was in the
16 dust collector or the ductwork at that time.

17 Q Okay. And, again, sometimes I will
18 need to go and clarify just so that I understand.
19 Your interest in finding out was what the components
20 were of the dust that was described as being in the
21 vents at the time of the explosion, correct?

22 A Both components and the chemistry of
23 it, what the explosive values of the material was.

24 Q All right.

1 A No.

2 Q Have you had any personal interviews
3 with any other LCM employees, such as Danny Collins?

4 A No.

5 Q Prior to preparing your report for
6 plaintiffs' counsel, did you request any additional
7 information that was not provided to you? You know,
8 let me withdraw that and ask it another way. Have you
9 asked for any information from plaintiffs' counsel
10 that has not been provided to you?

11 A There is nothing that I have asked for
12 that's not been provided to me. To give you a more
13 full answer, on the -- what I reviewed and the
14 information is in my report on Pages 7, 8, 9, and 10.
15 So that's more of a total listing of what I received
16 and what I reviewed.

17 Q And I understand that. I understand
18 what you did use. I am just asking if there was
19 something that you asked for that you were told either
20 it doesn't exist or we don't have it or we will get it
21 for you, anything like that.

22 A The only information that I asked for
23 that was -- that I was told was not available was dust
24 testing of the aluminum dust prior to the explosion.

1 from witnesses who were present at the time of the
2 event?

3 A The reports that I see from OSHA are
4 usually at the citation level, not at the
5 investigation level.

6 Q Would you agree with me that having
7 statements from witnesses who were present at the time
8 of the event is important in a full evaluation of the
9 causes of an event such as this?

10 A From the information that I have seen
11 and the depositions that I have read, I felt those
12 were the key players in the evaluation of the
13 explosion and didn't require any additional workers or
14 any additional information.

15 Q Have you ever read any statements from
16 any Federal-Mogul employees who were present at the
17 time of the explosion?

18 A I am not sure if David Garard was at
19 the -- present at that time or not.

20 Q And David Garard is the only
21 Federal-Mogul employee whose statements --

22 A That I can recollect right now.

23 Q Have you ever had any personal
24 interviews with any of the plaintiffs in this case?

1 provided.

2 Q Did you have any reports regarding the
3 investigation of the explosion?

4 A By?

5 Q By the Blacksburg Fire Department, by
6 OSHA, by any governmental agency.

7 A I have looked at the -- and this was
8 when we got in to do the site visit and the analysis
9 of the -- of all the information, I looked at the fire
10 department's evaluation. Did not look at OSHA's
11 evaluation.

12 Q Is there some reason you have not
13 looked at the OSHA report?

14 A No.

15 Q Would that contain information that
16 would be helpful to you in reaching a hypothesis or an
17 opinion in this matter?

18 A I don't feel that OSHA would have
19 anything in their report that would be more than what
20 was provided by the other information that I got.

21 Q Are you familiar with OSHA reports that
22 are done in situations such as this?

23 A Yes.

24 Q Do those reports contain statements

1 first time?

2 A I think August, early August.

3 Q Of this year?

4 A Of this year.

5 Q So between November of 2011 and August
6 of 2013, there was a continuous stream of information
7 being provided to you by the plaintiffs' counsel?

8 A Yes. I mean, not every day did I
9 receive something on it, but it may go two or three
10 months and I would review something, and then maybe a
11 month later I'd end up reviewing something.

12 Q Okay. Prior to your first visit to the
13 site in August of 2013, at that point -- prior to that
14 time, what written information or documentation did
15 you have other than what we have already discussed,
16 which is the video, the deposition transcripts of the
17 plaintiffs and the Federal-Mogul employees, and the
18 design --

19 A Design information.

20 Q -- information and the exhibits from
21 the depositions?

22 A The order information from -- for
23 Dustex, the order information for Kirk & Blum, all
24 relative documents about the equipment of what was

1 in the system, make sure that it was -- met the
2 function required, NFPA requirements, or the safe
3 operating.

4 Q You said earlier independent review of
5 all the information. At this point in time, all
6 you've told me that you have received were the
7 depositions of the plaintiffs and the Federal-Mogul
8 employees and the exhibits with those depositions.

9 A I guess the --

10 Q Is that correct?

11 A The initial part of it, the initial
12 contact would be to do that independent review. As
13 the depositions came in and requested different
14 information that was provided, I reviewed that
15 information. But the scope of what my direction was
16 was to take a look at the total system and analyze the
17 system and its components.

18 Q Is it fair to say that in order to
19 analyze the system and its components, then all you
20 needed was the deposition exhibits and the design
21 plans that you referred to?

22 A And also to visit the site, look at the
23 equipment.

24 Q When did you visit the site for the

1 specific aspect of the incident?

2 A No.

3 Q Were you asked the question like we'd
4 like to hear your opinion on what the cause of the
5 explosion was or some other aspect of this?

6 A No. What I was asked for was an
7 independent review of all the information with really
8 no pressure to say here is what your answer needs to
9 be in the end of it. A big part of my business is
10 providing that for manufacturing companies, is review
11 what they have to see if it's in compliance or where
12 they are deficient.

13 Q And that's where I was going, whether
14 they were asking you to evaluate, for example, the
15 ventilation system that was in place to determine
16 whether or not it was in compliance, if that was the
17 request, or if the request was can you provide us your
18 opinion on the function of the various components of
19 the system in the explosion that occurred.

20 A In both of those. In our business when
21 we do an analysis, we look at each piece of equipment.
22 If I was called into a plant to look at their dust
23 collection system to see if it was in compliance, we
24 would look at the total system and then each component

1 when I received any of the information. It's just
2 been ongoing.

3 Q Other than the deposition transcripts,
4 in terms of your initial review of the case, was there
5 anything else that you referred to when you first were
6 retained?

7 A No.

8 Q Did there come a point in time that you
9 requested additional documents from plaintiffs'
10 counsel for your review?

11 A Yes.

12 Q What documents did you request?

13 A Just design information from Dustex,
14 and I think it's more of the -- along the line of
15 exhibits that were in -- or information that was in
16 the depositions.

17 Q And again referring to the depositions
18 of the plaintiffs and the Federal-Mogul employees?

19 A Yes. Again, the exact timeline of when
20 I received what, I could go back and reconstruct it
21 maybe from e-mails or telephone conversations, but I
22 don't really recollect when that was -- happened.

23 Q When you were first retained to review
24 the case, were you asked to focus your review on any

1 you found news reports about the explosion that
2 occurred at the Federal-Mogul plant as part of your
3 ongoing professional duties?

4 A Yes.

5 Q Did there come a point in time that
6 plaintiffs' counsel provided you with a factual
7 background regarding their clients and/or the
8 incident?

9 A Yes. At what time or the dates, I am
10 not sure.

11 Q I'm more interested in what -- what
12 information was provided to you.

13 A Started -- the best of my memory, it
14 started with depositions.

15 Q Okay. And depositions of?

16 A Depositions of the employees that were
17 injured, depositions from Federal-Mogul's employees.

18 Q Did you receive those -- were they
19 transcripts of the depositions?

20 A Yes.

21 Q And did you receive those before you
22 received any other written materials relating to this
23 incident?

24 A I really don't have a good timeline on

1 for this case?

2 A No.

3 Q Was that done by another meeting, a
4 phone call, a letter?

5 A Best I can remember, another phone
6 call.

7 Q Were you given any additional
8 information about the case through that phone call?

9 A No, just to discuss the -- whether I
10 was interested in working with them on the case.

11 Q And was there a general discussion of
12 what the case was about at that time?

13 A Yes.

14 Q Can you tell me what you recall about
15 that conversation?

16 A I also knew from news reports what the
17 case was about as well.

18 Q And had you looked at the news reports
19 on your own or at the request of Mr. Brown and
20 Mr. Johnson?

21 A On my own in that I do a lot on web
22 sites and with the chemical safety board. I am not
23 sure where it would have come up at.

24 Q Okay. And again so that I am clear,

1 case that you were working on?

2 A Uh-huh.

3 Q And while you were having that meeting,
4 there was a discussion about this case?

5 A Yes.

6 Q And after viewing the video, did you
7 offer any opinions or information on what further
8 documents or data you would need?

9 A No, not at that time.

10 Q All right. Did there come a point in
11 time that you were retained to review additional
12 documents in this case?

13 A Yes.

14 Q When was that?

15 A I am not real sure of the dates, but
16 would have been within the last year.

17 Q You said the case was first mentioned
18 to you in November 2011?

19 A Yes.

20 Q So sometime during 2012 was when you
21 were contacted, or was it in 2013?

22 A I don't recollect.

23 Q Do you have any documents that would
24 refresh your recollection as to when you were retained

1 A I think November of 2011.

2 Q Who was it that contacted you?

3 A Mr. Brown and Mr. Johnson.

4 Q Was that in person or by phone?

5 A In person.

6 Q And was that here in Roanoke or at your
7 offices in South Carolina?

8 A It was in Hilton Head while I was on
9 vacation.

10 MR. ALEXANDER: Only you?

11

12 BY MR. MORRIS:

13 Q Prior to that meeting, had you received
14 any contact, any documents, any information about the
15 case?

16 A No.

17 Q Can you tell me what information you
18 were provided about the case at that first meeting.

19 A We were -- just reviewed video of the
20 explosion, discussed just the video, and that was the
21 extent of it. The main part of the meeting was for a
22 different case I was working with Mr. Brown on.

23 Q I see, okay. And just so that I am
24 clear, so the meeting was set up to discuss another

1 today, did you bring any written materials with you?

2 A Other than the report and just really
3 what's been issued, no. Nothing else in writing. No
4 notes.

5 Q When you say issued, what -- what are
6 you referring to?

7 A The report that I issued.

8 Q Okay. Do you have any documents that
9 have been provided to you by plaintiffs' counsel?

10 A Yes.

11 Q What documents do you have that were
12 provided to you by plaintiffs' counsel?

13 A They were detailed in the report.

14 Q Okay. So in the report there is a
15 listing of all the references in terms of documents
16 related --

17 A Yes.

18 Q -- to this case. And other than those,
19 you have no other documents?

20 A At this time I cannot think of any
21 other documents that I was provided since then.

22 Q Can you tell me when you were first
23 contacted by plaintiffs' counsel with respect to this
24 matter?

1 Doug Edwards?

2 A Yes.

3 Q Who is Doug Edwards?

4 A Doug Edwards was my counterpart in
5 Cincinnati. He was the director of engineering and
6 was responsible for the engineering portions of
7 Kbd/Technic in Cincinnati.

8 Q And during the time that you worked at
9 Kbd/Technic, did you ever work on any projects
10 together with Mr. Edwards?

11 A Yes.

12 Q And can you tell me what each of your
13 roles were in those projects?

14 A I would either be lead designer and he
15 would be a support or the other way around, and I
16 would provide engineering support for -- on his
17 projects.

18 Q Okay. So it's a collaborative effort
19 for --

20 A Collaborative effort.

21 Q And that would be for a client of
22 Kbd/Technic?

23 A Yes.

24 Q With respect to your deposition here

1 A He is a good engineer.

2 Q Are you familiar with his reputation in
3 the industry?

4 A He is, again, a good engineer.

5 Q And did you read the report from
6 Richard Roby?

7 A Yes. I reviewed it as well.

8 Q Do you know Richard Roby?

9 A No.

10 Q Are you aware that he is a member of
11 the committee for NFPA 921?

12 A No, but I also know other members of
13 the committee. That may not make them an expert in
14 anything more than being on the committee.

15 Q Absolutely. I just didn't know --

16 A I don't really think that buys you much
17 credentials on that.

18 Q So can you explain to me, what is
19 confirmational bias?

20 A I am not familiar with the term. I
21 know it's in 921 in the definitions. I know there is
22 a section on confirmational bias, but to sit here and
23 quote it -- if you want to get out 921, I can show you
24 where it is and tell you what it says.

1 into the plant. Imagine that the fireball is like a
2 big balloon. Anyplace that you put a hole in that
3 balloon, you are going to get equal flow out of. It's
4 looking for the least -- it's looking for the easiest
5 way out. If you build a enclosure that can withstand
6 the explosive forces without any problem and don't do
7 it and don't put anything on the inlet, that fireball
8 and all those gasses is going back into your process
9 where it's going to pick up fresh fuel. You are going
10 to have secondary explosions and, in this case, a
11 tragic incident.

12 Q Now, in this particular case, one of
13 the parts that we are referring to is my clients'
14 backblast damper. Within the ventilation field, okay,
15 what does blast mean?

16 A Blast means that it's going to stop a
17 blast.

18 Q And does it distinguish between what
19 that is a blast, whether it's a blast of air or an
20 explosion? Is there a difference?

21 A A blast -- it could be the pressure
22 wave ahead of the blast. The difference is a backflow
23 preventer is something that closes when the fan shuts
24 off to prevent air from going back into the building

1 based on that you have denser colder air on the
2 outside of it, less dense air on the inside of it, and
3 it's going to find equilibrium. So there are two
4 different types of devices. One is a backflow
5 preventer. The one is a backblast preventer.

6 Q In 2002 was that a distinguishing
7 description of those parts?

8 A In my -- in my view and my expectations
9 as a designer, of an engineer of those systems, I
10 would know the differentiation between those two
11 systems.

12 Q Okay. So if someone orders a backblast
13 damper, okay, from a catalog --

14 A It better -- if they are advertising it
15 as a backblast damper, then it better meet the
16 requirements that are required to withstand a
17 explosion that's inside that dust collector. All the
18 components of the dust collection system need to be
19 capable of withstanding that explosive pressure.

20 Q In your report, there is a couple --
21 couple places where you define the purpose of a
22 backblast damper as a device to prevent an explosion
23 from propagating through dust; is that correct?

24 A That could -- I am sure it says that in

1 determine what the rate of propagation for the flame
2 was?

3 A No, not on this specific case, no.

4 Q Okay. Is there a set formula that you
5 would use for that?

6 A Deflagration is a flame front moving at
7 less than the speed of sound. The speed of sound is
8 quite high, so it's going to move very quickly through
9 that ductwork.

10 Q So between the time that Mr. Hodges
11 says he sees the fireball and the time that it reaches
12 the open end of the duct where he is standing, can
13 you --

14 A Milliseconds.

15 Q Well, okay. Based on your experience
16 and to a reasonable degree of engineering probability,
17 can you tell us how long it would take for the
18 fireball to get to Mr. Hodges --

19 A I can calculate it, but I don't have it
20 with me here.

21 Q Okay.

22 A But I can calculate you -- calculate
23 that. Again, the rate of the fireball is also
24 dependent on the chemical characteristics of the dust.

1 accumulation at any particular point in that hopper?

2 A I didn't investigate exactly where that
3 point would be in the hopper or in that dust
4 collector, no.

5 Q And you didn't do any test to determine
6 how the angle of the hopper might affect the
7 particular material that was --

8 A Without having the -- without having
9 the material and the characteristics of the material
10 -- you can run a test where you can test what the
11 angle of repose is, when it will start to become
12 free-flowing. Without the material available, it's
13 not possible to do that test.

14 Q The bag house is designed so that the
15 material collects and goes down the slopes of the
16 hopper into a steel drum?

17 A Yes.

18 Q Now, the explosion didn't start in the
19 steel drum, did it?

20 A Again, I didn't -- I didn't pinpoint
21 where it could have started. You have a lot of fuel
22 into it. My understanding from the information was
23 that in the time it was -- at the time that they ran
24 the dust collector, they never emptied the 55-gallon

1 have been in this bag house with the particular
2 material that was in place there?

3 A I would know -- I would know if they
4 had had it tested.

5 Q But you didn't get a sample, so you
6 don't know?

7 A And it was never tested prior to the
8 explosion.

9 Q So you do agree that you don't know?

10 A I agree that I don't know, but it's
11 information that if you did have it, you would use it
12 in your evaluation.

13 Q All right. Now, in your scenario, the
14 explosion began in the bag house, and there were --
15 was a shock wave and then followed by a fireball that
16 traveled back through the ductwork and back through
17 the -- and pushed open the backblast damper and went
18 through the ductwork and burned the plaintiffs?

19 A Well, it took many paths. The same
20 fireball could have went -- the same fireball would
21 have went down into the 55-gallon drum. The same
22 fireball would have went out through the fan.
23 Anyplace -- the same fireball -- when the vent did
24 open up, the fireball went out it. When the side of

1 That's why NFPA requires that you have
2 minimum conveying velocities in your ductwork so you
3 do not have a buildup of dust anywhere in those
4 systems.

5 Q So what I was getting to is: Do you
6 have an opinion as to whether or not there was any
7 combustion of material that was in the ductwork
8 between the backblast damper that we have talked about
9 today and the open end where the two plaintiffs were
10 standing?

11 A In my opinion, yes, there would be
12 combustion because you have fresh fuel and you have --
13 but it wouldn't be dependent -- dependent on them
14 stirring it up. You are looking at a pressure wave
15 that's moving at the speed of sound is a lot -- is
16 going to generate a lot more turbulence and a lot more
17 dust pickup than anything they could do with that
18 lance.

19 Q All right. Now, as I understand your
20 expert opinion with regard to Dustex, you believe that
21 the blast doors were too small for this application?

22 A My calculations show they were.

23 Q All right. Had the blast doors been of
24 the size that you specify in your report, which were I

1 Q -- to explain how it ended up where it
2 did?

3 A No. Just that the -- that the
4 explosive forces were greater than the P-ultimate of
5 the bag house due to the observations of the failure.

6 Q Did you make any attempt to calculate
7 the duration of the explosion from the point of
8 ignition --

9 A No.

10 Q -- to the point where the pressure --

11 A No.

12 Q Let me finish. -- from the point of
13 ignition, the point in time of ignition, to the point
14 in time when the pressure had returned to basically
15 atmospheric.

16 A No. Without knowing the dust
17 characteristics of how fast that would go, how fast it
18 would take to explode, you can't calculate it.

19 Q Looking at the Exhibit 15 and 16 that
20 refer to a backblast damper, is it your testimony that
21 the term "blast" in -- as was used for the description
22 of that K&B device refers to as a synonym of an
23 explosion?

24 A I would say that if it says blast, that

1 A Other than I saw this is what Dustex
2 recommends as the correct solution for what their
3 problem is. It was part of their proposal was a
4 statement in there saying that was the right -- you
5 know, this is the right equipment for your
6 application.

7 Q So proposal --

8 A So I'm assuming -- I am assuming --

9 Q Proposal and Garard's testimony?

10 A Yeah.

11 MR. BROWN: That's been asked --

12 THE WITNESS: And specifications. I
13 mean, there is -- I guess I don't understand
14 the breadth of the question.

15

16 BY MR. ALEXANDER:

17 Q Did you make any attempt to quantify
18 the duration of time or the amount of heat that would
19 be required under the weather conditions that morning
20 to precipitate an explosive reaction?

21 A No.

22 Q Minimum energy ignition --

23 A Without the chemical composition of the
24 dust, you can't calculate it.

1 BY MR. BROWN:

2 Q Maybe you didn't understand.

3 A I'm losing my train of --

4 MR. HARBERT: Let's start tomorrow
5 morning, gentlemen. My time is up.

6 MR. BROWN: I don't want to leave this
7 question hanging right here.

8 THE WITNESS: Let's do it one more
9 time.

10

11 BY MR. BROWN:

12 Q Okay. My question is: Not absolutely
13 100 percent certainty, but to a reasonable degree of
14 probability, are you still able to tell us where the
15 most likely portion of the origin of the explosion is?

16 A I can still -- the origin of the
17 explosion was based on exothermic reaction, not the
18 size of the particulate.

19 Q So does the -- not having the size,
20 precise size, of the particulate, does that in any way
21 impair the opinions that you have got --

22 A No.

23 Q -- in your report?

24 A No, it does not.

1 impossible for you to come up with an opinion to a
2 reasonable degree of engineering probability as to the
3 origin of this fire?

4 A Start over again.

5 Q You testified earlier that there was no
6 testing done before the fire of the material, right?

7 A Yes.

8 Q And my question is: Is that -- and you
9 answered a number of questions with that you didn't
10 know what different values were. Does that mean that
11 you cannot come up with a good engineering opinion as
12 to the origin of the fire? Are you still able to do
13 that?

14 A Without knowing all the chemistry side
15 of it and the chemical parts, to have a hundred
16 percent certainty of what caused the fire, you would
17 need to have all that information.

18 Q That wasn't my question.

19 A At what point --

20 MR. HUDGINS: Wait a minute. Let
21 him -- I am liking it so far.

22 THE WITNESS: No. But that doesn't
23 mean that -- you know, it -- let's start
24 over. I still --

1 build up is the heavier particulate. The fine
2 particulate would continue on into the bag house.
3 Eventually --

4 Q What -- go ahead.

5 A Eventually, if the duct got choked up
6 enough and the velocity got high enough, it may start
7 picking up the larger stuff and moving it as well.

8 Q What does that tell you about the
9 likelihood of a fire -- you know, as a factor, the
10 likelihood of the explosion being in the bag house as
11 opposed to the duct?

12 A The likelihood is that the -- again,
13 the bag house is a very good classifier of material.
14 First, if it fell out into the duct, the heavier part
15 didn't even get to the hopper. The next separation
16 would be in the hopper with -- heavier particles would
17 end up in the hopper. The light dust would end up on
18 the filter media as part of the dust cake, which then
19 is more explosive. The smaller the particle, the more
20 explosive the particle.

21 Q The fact that there was no testing done
22 of the material before the explosion, and you are not
23 able to give some precise values, and you have talked
24 about that, does that make it -- does that make it

1 4500 feet per minute. It was not tested, but most
2 materials of that size and that particulate will
3 convey at 3500 feet per minute. That comes out of the
4 ACGIH guide, industrial ventilation guide. So they
5 gave you a higher rate to make sure that the ductwork
6 stays clean.

7 Q So -- and what evidence do you have
8 that there was not sufficient conveying velocity?

9 A There probably was sufficient conveying
10 velocity when the ductwork filled up to three or four
11 inches high. Eventually, it will convey. Once you
12 have built up enough dust in there to reduce the area,
13 then it will convey. But you shouldn't have three or
14 four inches or five inches of dust in the bottom of
15 the -- that's not acceptable.

16 Q What effect does the failure to have
17 conveying velocity have on the concentration -- if
18 any, on the concentration of the more dangerous
19 smaller particles in the bag house as opposed to
20 what's happening in the ductwork itself?

21 A Again, in the smaller -- the lighter
22 the particle, the smaller the particle is conveyed at
23 a lower velocity than what the heavier parts are. So
24 what would stay in the ductwork first and start to

1 safe for its intended use?

2 A No, it was not reasonably safe for its
3 intended use.

4 Q So you have an opinion, yes, but the
5 opinion is no, that it is not?

6 A Yes, I have an opinion, and the opinion
7 is --

8 MR. HUDGINS: Objection, leading.

9 MR. ALEXANDER: Yes. Let him testify,
10 not you.

11 THE WITNESS: Yes. And it's
12 available -- the information is available.
13 And having the information and doing that is
14 that the unit should have either been
15 provided with additional vents or different
16 types of vents, something that was going to
17 make it handle the case of the 415 Kst.

18

19 BY MR. BROWN:

20 Q Did the system that was put in the
21 Federal-Mogul plant have sufficient conveying
22 velocity?

23 A No. And that is given is that the
24 conveying velocity of -- that's required by NFPA is

1 A That would be -- that would be the
2 place I would go to in making that determination.

3 Q Well, we are not so concerned about
4 what we would do. What about a reasonably prudent
5 engineer?

6 A Reasonably prudent engineer would use
7 that information.

8 Q To come up -- all right.

9 A I would base it on something that's a
10 standard, not something pulled out of the air.

11 Q All right. And, again, we are not
12 asking you what you would do so much as we are asking
13 what a reasonable and prudent manufacturer would do.

14 A Okay.

15 Q Would a reasonably prudent manufacturer
16 then look to NFPA 68 with this information, that is,
17 the information in Exhibit Number 17, to be able to
18 design a reasonably safe dust bag house for this --
19 for this application? And the answer is?

20 A Yes.

21 Q All right. And so do you have an
22 opinion to a reasonable degree of engineering
23 probability as to whether or not the Dustex bag house,
24 as sold and delivered to Federal-Mogul, was reasonably

1 bag house for this application?

2 A Yes. That was included in my report.

3 Q And what was the result of that?

4 A The resulting pressures were -- or

5 resulting size was roughly half of the required

6 amount. I can go back through the --

7 Q Okay. And that's been made an exhibit?

8 A Yeah.

9 Q So you are looking at the calculations
10 that you did. So when you were talking about not
11 having the Kst or the values for the particular
12 aluminum dust on -- you know, before -- you know,
13 before the manufacturer, did that prevent you from
14 coming up with a reliable opinion onto whether or not
15 those --

16 A No.

17 Q Why not?

18 A Because I based it on information that
19 was provided by NFPA in their standard for explosion
20 protection and utilized those numbers in doing the
21 calculations.

22 Q And if that information was indeed not
23 available to Dustex, is that where Dustex would go --
24 could have gone in order to get the information?

1 A No.

2 Q Okay. Is there a way that a
3 manufacturer -- in the absence of the material actual
4 testing, because the unit hasn't been built yet, is
5 there a way that's provided under NFPA 68 to make a
6 determination of how to safely design the unit?

7 A In NFPA 68 they have representative
8 dust Kst's and Pmax's for different materials.
9 Aluminum dust was one of those.

10 Q And what was the Kst?

11 A Kst was 415.

12 Q All right. And with that information
13 that they had then, was Dustex in a position to
14 manufacture a bag house then with the information that
15 would be reasonably safe by taking into account the
16 Kst value that's contained in the NFPA 68?

17 A Yes.

18 Q Okay.

19 A They would have an obligation to make
20 sure that the design of their explosion vents met the
21 requirements of the dust that they were producing.

22 Q All right. And have you made
23 calculations using the NFPA 68 to determine the
24 venting that should have been used for this particular

1 in this case was two to three grains per standard
2 cubic foot.

3 The second sentence says -- first under
4 A, it says, System conditions as we understand those.
5 That's what the understanding of what they are
6 designing it against. B is Proposed Dustex Equipment
7 For This Application. It goes down to quantity of it,
8 the model of it, the type of bags, the length of the
9 bags, the bag material --

10 Q For time, let me interrupt.

11 A All of the design.

12 Q If somebody wants to object to my
13 interrupting, I will stop interrupting, but I want to
14 try and get through here. What was the material that
15 Dustex was advised by that document was going to be
16 removed? What kind of dust was it?

17 A Filtration contaminated dust from
18 aluminum sanding operations.

19 Q All right. And does that information
20 contain -- give us any testing of the particular
21 material that was going to be removed?

22 A No.

23 Q And, indeed, it had not been built at
24 that point, right?

1 unless he has personal knowledge.

2 MR. BROWN: He can --

3

4 BY MR. BROWN:

5 Q What information did this document,
6 that is, Number 17, give to Dustex that relates to the
7 design requirements for the bag house if they were
8 going to sell? You got that?

9 A Yeah.

10 Q Give me an answer.

11 A Yeah, I will answer it. In the
12 industry of dust collection, the -- because this is
13 specialized equipment -- and this held true if it was
14 at Pneumafil or Donaldson or Dustex or Flex-Kleen.
15 There is information that you provide them so that
16 they can select the equipment, the appropriate
17 equipment, to do it.

18 Q And the they is who?

19 A The manufacturer.

20 Q In this case, Dustex?

21 A In this case, Dustex. And some of the
22 information that you provide, you know, includes the
23 type of dust that it's going to be, your airflow of
24 it, what your inlet pressure is. Your inlet loading

1 pressures. Somebody had to engineer the system.

2 Q And based on your experience, what --
3 and what -- then based on this document, what was your
4 understanding -- that is Number 17 -- of what Dustex
5 knew about the type of material that was being --

6 MR. ALEXANDER: Object to the form of
7 that question.

8 MR. BROWN: I understand.

9
10 BY MR. BROWN:

11 Q What was your understanding of what
12 they would know?

13 MR. HUDGINS: Objection. You are
14 asking him to speculate as to what somebody
15 else --

16
17 BY MR. BROWN:

18 Q What information did they have that was
19 relevant to the design requirements of a person who is
20 going to be selling a bag house for industrial dust?

21 MR. HUDGINS: The document speaks for
22 it itself.

23 MR. ALEXANDER: Same objection about
24 what they had. He can't know what they had

1 industry and the trade?

2 A I am familiar, yeah.

3 Q Okay. Go ahead. So what does 17 tell
4 us?

5 A 17 tells us the size of the equipment,
6 what the model numbers were, hopper sizes,
7 air-to-cloth ratios, which would be -- an air-to-cloth
8 ratio is important in determining if the application
9 of the filter -- different materials or different
10 dusts require different air-to-cloth ratios.

11 Q Is any of that information,
12 air-to-cloth ratio and all that information, is that
13 included in the specification --

14 A No.

15 Q -- document?

16 MR. HUDGINS: Objection to the extent
17 those documents speak for themselves.

18

19 BY MR. BROWN:

20 Q So where does that information come
21 from then?

22 A Whoever designed the system and
23 selected the equipment came up with those model
24 numbers, equipment sizes, fan, horsepower, static

1 system, including estimated airflow requirements,
2 static pressure, et cetera, should be provided with
3 the proposal. Two copies of operating procedures,
4 troubleshooting guides, and spare parts should be
5 included with the equipment.

6 Q And that was what was sent to --

7 A This is what was sent.

8 Q And who was it sent to, Carrington?

9 A It was sent to Carrington.

10 Q Okay.

11 A So it gave them the general
12 requirements, but the actual design requirements and
13 selection of equipment requirements rested with
14 Carrington. Whether they passed that on to Dustex or
15 anybody else, that would really be up to Carrington.

16 Q So let's take a look at that. Then we
17 will take a look at Exhibit Number 17. Does that give
18 us information about what information was passed
19 along?

20 MR. HUDGINS: Objection to the extent
21 that the document speaks for itself.

22

23 BY MR. BROWN:

24 Q All right. You are familiar with the

1 (Deposition Exhibit Schloss 19 was
2 marked and entered into the Record.)
3

4 BY MR. BROWN:

5 Q Okay. I am going to show you Garard --
6 what's now marked as Deposition Exhibit 19. Tell us
7 what that is.

8 A That was the collection system
9 equipment specifications provided by Federal-Mogul to
10 Carrington Engineering.

11 Q All right. And what do we mean by --
12 what is meant by the term "performance specification"?

13 A Performance specification is here are
14 the requirements of the system to perform to. The
15 actual design selection and -- of all the equipment is
16 up to the bidder. And he had asked for both
17 individual costing on each one of the pieces of
18 equipment as well as the sizes, the -- some of the
19 things that they are looking for with the proposal,
20 general arrangement drawings showing overall
21 dimensions, location of operator controls, location of
22 required utilities provided with each collection
23 system with the proposal.

24 Complete description of each collection

1 sequence from the three plaintiffs, or did I
2 miss a meeting? I guess it's -- where are
3 the first 16? You are marking that 17. What
4 was 1 through 15?

5 THE WITNESS: Oh, a lot of those were
6 pictures.

7 MR. HUDGINS: Oh, okay. These were
8 just his premarked numbers that we are using.

9 MR. BROWN: No, these are the court
10 reporter's markings.

11 MR. HUDGINS: Have we talked about 17
12 exhibits today?

13 MR. JOHNSON: Yeah, we had all these
14 photo --

15 MR. HUDGINS: Oh, that's right, all of
16 these photographs. I'm sorry.

17

18 BY MR. BROWN:

19 Q All right. I'm going to show you --

20 MR. BROWN: 18, madam court reporter?

21 THE WITNESS: That was also someone
22 else's exhibit.

23 MR. BROWN: 19. It was also Garard
24 Exhibit Number 3 on the deposition.

1 MR. BROWN: We will see where we are at
2 the end of 15 minutes, and we will see if we
3 are -- could stand on that.
4

5 BY MR. BROWN:

6 Q Did any of the questions that were
7 asked by the defense counsel up until now change any
8 of the opinions contained in Deposition Exhibit 18?

9 A No. I still stand by all those.

10 Q All right. Now, do you have the
11 proposal that was made by Mr. Garard to -- and
12 forwarded to Carrington Industries with you?

13 A I have the specifications.

14 Q The specifications. Let's call them
15 what they are, the specifications. Would you pull
16 that out, please, and may we mark that.

17 A I also have Dustex's order
18 acknowledgement.

19 Q I am going to ask you about that, but
20 let's start with the -- with the specifications.

21 MR. HUDGINS: What did we mark that
22 Dustex proposal?

23 MR. BROWN: That was Number 17.

24 MR. HUDGINS: Is this running in

1 the form?

2 THE WITNESS: Everything that was
3 written in the proposal is based on my
4 professional opinion of the facts and is the
5 analysis that I went through in making my
6 determinations.

7

8 BY MR. BROWN:

9 Q When you say proposal, you mean the --

10 A I'm sorry, report.

11 Q The report, okay.

12 MR. BROWN: Is there still an
13 objection? Because I want to be able to meet
14 the objection.

15 MR. MORRIS: The objection to the form
16 is that it's improper to -- as to a general
17 overall statement for all of the opinions.

18 MR. BROWN: Okay. Then we might be
19 here a little while. Okay.

20 MR. HARBERT: Then I move we come back
21 tomorrow morning, guys. I told you I have
22 got family commitments in about 15 minutes.
23 If you want to go through each one of those
24 opinions one at a time --

1 Q Now, does that report contain your
2 opinions and the basis of your opinions regarding this
3 case?

4 A Yes.

5 Q And are all those opinions to a
6 reasonable degree of engineering probability or
7 certainty?

8 A Yes.

9 MR. MORRIS: Note my objection to the
10 form.

11 MR. HUDGINS: Object to the form.

12

13 BY MR. BROWN:

14 Q Were all of those opinions to a
15 reasonable degree of engineering probability?

16 MR. MORRIS: Objection.

17 MR. HUDGINS: Same objection.

18

19 BY MR. BROWN:

20 Q Okay. You can go ahead and answer.

21 A Both.

22 MR. BROWN: And if it's a form
23 question, can you tell me what your problem
24 with the form is? What's the problem with

1 EXAMINATION

2

3 BY MR. BROWN:

4 Q I have in my hand Deposition Exhibit
5 Number 17, Dustex, contains the language, Enclosed is
6 our quotation for equipment we feel best -- will best
7 suit your needs based on the application data outlined
8 to us. Is that what you had just been talking about
9 earlier in answer to Dustex counsel's questions --

10 A Yes.

11 Q -- for identification?

12 A Yes.

13 Q We are going to come back to that.

14 MR. BROWN: May I have another sticker
15 please, madam court reporter.

16

17 (Deposition Exhibit Schloss 18 was
18 marked and entered into the Record.)

19

20 BY MR. BROWN:

21 Q I am going to show you Deposition
22 Exhibit Number 18. Can you tell us what that is?

23 A That's a report that I prepared for
24 yourself and for the court.

1 Federal-Mogul and my client, Dustex, or, you know,
2 through the Carrington agency?

3 A There is a couple e-mails between them.
4 One was talking about the limited liability on the
5 terms and conditions side of it. I see on the
6 reference here is the reference to Dustex on a
7 proposal was a telephone conversation, so they must
8 have discussed what the application was in between it
9 on the phone, but I didn't see a phone record of what
10 was discussed at that point.

11 Q Besides the e-mails and that document,
12 that's the only information exchange that you are
13 aware of?

14 A No, I mean, unless -- unless it's in
15 the information that I reviewed in that list, no. I
16 would just say what's on that list is what I reviewed.

17 MR. HUDGINS: All right. Thank you.

18 You have the floor, sir.

19 MR. BROWN: All right. Let me have --
20 for the Record, let's mark this as an
21 exhibit.

22
23 (Deposition Exhibit Schloss 17 was
24 marked and entered into the Record.)

1 BY MR. HUDGINS:

2 Q The piece of paper that you are holding
3 does not have any Bates numbers on it, but it's the
4 Federal -- excuse me, the Dustex proposal to
5 Federal-Mogul. What's the date of that?

6 A 3/19/02.

7 Q And that's what you were referring to
8 earlier in your testimony?

9 A Yeah, the whole proposal, but that one
10 part of it says that, you know, enclosed are --
11 enclosed is our quotation for the equipment we feel
12 best suits your needs based on the application data.
13 And below that, the application filtration of
14 contaminated dust from aluminum sanding operation,
15 type of dust aluminum/metallic, 4000 CFM. It gives
16 inlet loadings. And there was also proposals for
17 antistatic bags on the filter bags to make sure that
18 you didn't have sparking in the dust collector. You
19 have Brixon latches, explosion relief vents. All that
20 is detailed in their proposal.

21 Q That document obviously speaks for
22 itself. Besides the information that is referenced in
23 that document, are you aware of any other
24 communications or information exchange between

1 proposal out.

2 MR. BROWN: Why don't we real quick
3 make a couple copies of that.

4 THE WITNESS: Let me just do -- it
5 says, Enclosed is our quotation for equipment
6 we feel will best suit your needs based on
7 the application data outlined to us. That's
8 in the first paragraph right below the
9 header.

10

11 BY MR. HUDGINS:

12 Q And that's what you were referring to
13 in your testimony earlier?

14 A Yeah, the two -- that Dustex reviewed
15 the information and provided equipment that was the
16 best -- suit their needs.

17 Q All right. And that's --

18 A I took that at face value.

19 Q That's as specific as it got?

20 THE VIDEOGRAPHER: Counsel, we had gone
21 off, and now we are back on. I'm sorry. The
22 last question and answer, if you could
23 repeat, please.

24

1 witness say that there was a piece of paper
2 that my client stated that the bag house that
3 was sold to Federal-Mogul was the equipment
4 that was specific to their request. I
5 don't --

6 MR. BROWN: I was going to ask him
7 about that.

8

9 EXAMINATION

10

11 BY MR. HUDGINS:

12 Q I'd like to just -- what piece of paper
13 are we --

14 A It's on the proposal itself.

15 Q Can you find that in your materials so
16 that I will know what your testimony is based upon?

17 MR. BROWN: Pull that out, and we will
18 make that an exhibit. I was going to ask you
19 about that.

20

21 BY MR. HUDGINS:

22 Q Is there a Bates number on that that
23 you can direct me to?

24 A No, but let me -- let me pull the

1 Q The duct, all right. So that situation
2 is always going to exist when the machinery is not
3 operating?

4 A No. It has to be cold outside.

5 Q Okay. That situation is always going
6 to exist in the cold weather months when the machinery
7 is not operating?

8 A That risk is going to be there during
9 that time.

10 Q You --

11 A Whether it turns into a hazard, I don't
12 know, but the risk is there.

13 Q You have provided in your report a list
14 of cases in which you have testified in the past four
15 or five years. What I'd like to know is: Has your
16 expert opinion as to the origin and cause of a fire
17 ever been accepted by any court?

18 A I have never been to court. I have
19 been deposed, but never to court.

20 MR. HARBERT: That's all the questions
21 I have.

22 MR. HUDGINS: I need to ask one real
23 quick question because it came as a complete
24 shock and surprise to me when I heard the

1 vent that and would reduce the exothermic. But,
2 again, exothermic could be in the bottom of a pile
3 that isn't -- you know, that's covered up. So it
4 doesn't prevent it.

5 Q But the risk of an exothermic reaction
6 goes up when you turn the equipment off?

7 A Yeah, because you are not -- you have
8 no chance of dissipating the heat away from it at that
9 point.

10 Q Until the heat inside the bag house is
11 reduced to be the equivalent of the heat outside the
12 bag house and the condensation process stops?

13 A Condensation process is going to keep
14 going as long as you have vapor coming from the plant
15 going out into that bag house.

16 Q Okay. But if the air --

17 A Air can travel one way. Vapor can
18 travel against the airflow. So even if you had
19 airflow the other way, water vapor can travel based on
20 vapor pressure, not on humidity. But it would have
21 kept -- it would have kept on building up if it had a
22 source of access to the inside air.

23 Q The source of access being?

24 A The ductwork.

1 Q I couldn't find it anyplace.

2 A No, because it wasn't -- I didn't get
3 into what actually caused the, you know, humidity in
4 it.

5 Q Is it your opinion that it was improper
6 for Federal-Mogul to have both wet filtering and dry
7 filtering apparatuses?

8 A No. Each of them have their own
9 application. In the sanding side of it, which has the
10 wet, you are going to end up with more hot embers
11 going into it, very small particulate, very explosive,
12 and a wet collector is the right selection. I didn't
13 have any problem with the specifications as they
14 were -- as put forward.

15 Q As I understand your theory as to the
16 cause of this fire, the warm air from inside the plant
17 is drawn into the bag house by the operation of the
18 bag house, correct?

19 A Yeah.

20 Q And, normally, the operation of the bag
21 house provides sufficient ventilation to prevent the
22 exothermic reaction?

23 A It would prevent the buildup of -- it
24 would -- buildup of any hydrogen in there. It would

1 Q So --

2 A You could speculate it.

3 Q Right. But it would have to be
4 speculative to do that?

5 A And I saw in some of the other
6 testimonies or some of the experts speculated to what
7 it would be.

8 MR. ALEXANDER: I have no further
9 questions. Thank you.

10

11 EXAMINATION

12

13 BY MR. HARBERT:

14 Q Just very briefly, Mr. Schloss. My
15 name is Guy Harbert. I represent Federal-Mogul. I
16 apologize for my voice. It's actually better than it
17 was last week. I just have a very few questions for
18 you.

19 A Uh-huh.

20 Q The water vapor-producing machinery
21 that you alluded to earlier today, is that referenced
22 in your report?

23 A No. I think in the report I just said
24 water -- condensation.

1 A Other than I saw this is what Dustex
2 recommends as the correct solution for what their
3 problem is. It was part of their proposal was a
4 statement in there saying that was the right -- you
5 know, this is the right equipment for your
6 application.

7 Q So proposal --

8 A So I'm assuming -- I am assuming --

9 Q Proposal and Garard's testimony?

10 A Yeah.

11 MR. BROWN: That's been asked --

12 THE WITNESS: And specifications. I
13 mean, there is -- I guess I don't understand
14 the breadth of the question.

15

16 BY MR. ALEXANDER:

17 Q Did you make any attempt to quantify
18 the duration of time or the amount of heat that would
19 be required under the weather conditions that morning
20 to precipitate an explosive reaction?

21 A No.

22 Q Minimum energy ignition --

23 A Without the chemical composition of the
24 dust, you can't calculate it.

1 that type of dust, that airflow, and that application.
2 You might end up with a bag house for aluminum dust
3 that is half the size of something that's for chicken
4 feathers. So, again, it's based on -- their selection
5 is based on the application of the dust that's there.

6 Q Is there any other information other
7 than Dave Garard's testimony and the information that
8 went from -- from Federal-Mogul through Carrington to
9 Dustex, which is the basis of your conclusion that
10 there was collaborative design?

11 A Off the top of my head, I can't
12 remember. I mean, it's late in the day. There might
13 be something else that's in there, and I can look
14 through the books and see. But that's what comes as
15 the major part of my decision was is based on the
16 testimony and the deposition of David Garard and my --
17 and my experience in the dust collection industry as a
18 manufacturer, as an engineer, and actually purchasing.

19 Q But you -- without regard to your own
20 prior experience, you do not know what occurred on
21 this particular design or transaction other than those
22 two pieces of information we have --

23 A Other than I saw --

24 Q -- presently identified?

1 that they collaborated with Federal-Mogul and others?

2 A Because in the information that was
3 provided, David Garard's testimony said it was a
4 collaborative effort between the group.

5 Q And that's the sole basis of your
6 conclusion?

7 A He gave them the specifications -- he
8 gave them performance specifications that said here is
9 what it needs to perform. Someone at that point had
10 to decide the ductwork layouts, the -- the selection
11 of the dust collector, selection of the backdraft
12 backblast damper. Would have had to do the system
13 design at that point. I didn't see design drawings
14 were provided with the specifications.

15 Q Were you provided with any information
16 that would have enabled you to identify which
17 individual or entity did those specific tasks?

18 A In the information that I have, it
19 shows that the information was conveyed from
20 Federal-Mogul to Carrington to Dustex. So Dustex
21 would have been -- Dustex and Carrington would have
22 been involved in the selection of that equipment.

23 Again, too, the selection of equipment
24 is based on the manufacturer's recommendations for

1 NFPA requires that you discharge them to the outside
2 and not return them to the building.

3 Q That's not what I just asked you, was
4 it?

5 A I thought it was.

6 Q I asked you about whether the fan would
7 have been damaged.

8 MR. BROWN: I think he answered the
9 question.

10

11 BY MR. ALEXANDER:

12 Q Which failed -- which burst first, the
13 bag house or the backdraft damper?

14 A I would say they burst within
15 milliseconds of one another. Which one went first?
16 Again, you are talking about a duration that's less
17 than a tenth of a second. So what came first, the
18 chicken or the egg? Typically, the dust collector
19 goes first and the backdraft damper would go second,
20 because if you are going to have the explosion inside
21 the dust collector, it's going to see the rapid rise
22 of pressure first.

23 Q What design activities by Carrington do
24 you include as the basis of your prior testimony today

1 system?

2 A No. Draft is. Backdraft damper --

3 Q But your --

4 A -- comes back as a backdraft.

5 Q Your testimony is that blast is not

6 used to refer to the direction of air movement?

7 A Not in my professional opinion, no.

8 Q Did you -- you testified that the

9 fan -- that the blast would have gone through the fan?

10 A Yes.

11 Q And the fan would have been damaged as

12 a result of that?

13 A No.

14 Q Why not?

15 A The fan is built out of heavy material

16 handling equipment gauges. It could have been damaged

17 in the -- in the thing, but -- in the explosion, but

18 it wouldn't necessarily have to be. And, again, that

19 was a -- the explosion going through the fan was just

20 going to relieve that explosion to the outside. If

21 that duct was tied back into the inside of the plant,

22 then it would require an isolation device be put

23 between the fan and the building to return that air

24 back into the building. On aluminum dust collectors,

1 that was part of a explosion protection device, that
2 it was installed as an explosion protection device,
3 and that factory -- I mean, Federal-Mogul, David
4 Garard, said he bought it as a isolation device, that
5 that's what his assumption of what that device was
6 for.

7 Q Let me ask the question again. Does
8 blast on that name, is that a synonym for explosion?

9 A Those dampers that are doing it, they
10 are called backblast dampers, backblast preventers.
11 There is numerous names for it.

12 Q Is it your testimony that the term
13 "blast" used with this product is not the historic
14 term "blast" meaning air movement as in the air
15 movement industry? Is that your testimony?

16 A Yeah, because blast and the air moving,
17 you are talking about air coming -- rotation of a fan
18 doesn't equal explosion protection. In the explosion
19 protection business, blast means a explosion. If you
20 are putting a device in as an explosion protection
21 thing, blast means the blast from an explosion.

22 Q Is it not so that the term "blast" is
23 commonly used in the air moving, air design industry
24 to refer to the direction which air moves within that

1 Q -- to explain how it ended up where it
2 did?

3 A No. Just that the -- that the
4 explosive forces were greater than the P-ultimate of
5 the bag house due to the observations of the failure.

6 Q Did you make any attempt to calculate
7 the duration of the explosion from the point of
8 ignition --

9 A No.

10 Q -- to the point where the pressure --

11 A No.

12 Q Let me finish. -- from the point of
13 ignition, the point in time of ignition, to the point
14 in time when the pressure had returned to basically
15 atmospheric.

16 A No. Without knowing the dust
17 characteristics of how fast that would go, how fast it
18 would take to explode, you can't calculate it.

19 Q Looking at the Exhibit 15 and 16 that
20 refer to a backblast damper, is it your testimony that
21 the term "blast" in -- as was used for the description
22 of that K&B device refers to as a synonym of an
23 explosion?

24 A I would say that if it says blast, that

1 Q -- like that may have occurred -- I
2 need to be able to finish my question.

3 A Okay.

4 Q On the possibility that there may have
5 been some event that caused a dispersion, right?

6 A Start over.

7 Q Your -- you have drawn the conclusion
8 that you have had based upon the assumption that there
9 was a dispersal event, dispersion event, in the bag
10 house, but we have no evidence that such an event, in
11 fact, occurred?

12 A There is no evidence that it didn't
13 occur. I mean, it's -- it's based on the -- all the
14 perfect storm coming together at the same point. And
15 you are doing the same thing internally in that
16 ductwork in the plant. You are assuming that you have
17 a MEC level, minimum explosive concentration level, at
18 the same time you have enough energy to set the
19 aluminum dust off that you don't have any idea how
20 much energy that takes. So if you add all those
21 together, you are in the same boat.

22 Q Did you attempt to quantify the forces
23 of the explosion in the bag house --

24 A No.

1 how they were doing it, were they taking it and
2 jamming it in two feet and stirring it around? I
3 didn't see any information like that. So to know that
4 it created -- if you were vacuuming it passively and
5 getting it close to it and allowing it to suck it up,
6 there would be no dispersion. If you are in there
7 twirling something around trying to get it to break
8 up, then you are going to have more dispersion with
9 it.

10 But, again, without knowing what the
11 minimum explosive concentration -- and, again, these
12 explosive concentrations are pretty thick. Explosive
13 concentration on coal dust, you can't see a 25-watt
14 light bulb through a six-foot coal dust thing. So
15 it's not like a little puff of powder when you empty a
16 flour. It's -- you can't see through it.

17 Q Okay. And we have no information or
18 evidence at all whether there was any dispersion of
19 dust at all within the bag house at this time, do we?

20 A There are ways you can have dispersion
21 in the bag house when it's sitting inoperable, and
22 that's what I base my opinions on.

23 Q On the possibility that some event --

24 A Because -- because they are --

1 A No.

2 Q Okay.

3 A In a design that -- in the case of
4 this, if there is no Kst value that's been determined,
5 many times they will have a similar process that has a
6 Kst value. And, you know, after -- really, at that
7 point then, you are going to available data, but you
8 are going to look for the worst possible case in the
9 available data. You don't want to be too small in the
10 explosion protection. And then once it's run, then we
11 have the manufacturer, the customer, go do the test to
12 validate our conclusions, or validate our assumptions.

13 Q But with respect to the dust in this
14 individual case, all of that would be speculative,
15 correct?

16 A Without having that test, no, I mean,
17 there is no way of knowing now.

18 Q With respect to the dispersal of the
19 dust, which is required for an explosion, what degree
20 of dispersal occurs, in your opinion, with the
21 vacuuming in the duct?

22 A It would be hard to speculate that.
23 Again, on the -- you are actually sucking in and
24 having it under a negative pressure. The method of

1 Q Right. You can't really correlate this
2 dust to what --

3 A No.

4 Q -- was the aluminum dust in this plant
5 without actually testing it?

6 A Yeah. What that showed was the
7 characteristic of the dust, that it wasn't aluminum
8 turnings, it wasn't large particulate, that it was a
9 fine particulate that was coming off with the brushing
10 operations.

11 Q So you --

12 A It was more just for an informational
13 thing to look at, what did a similar process -- but,
14 again, on steel, which is going to have different
15 requirements than aluminum is going to have. But what
16 did the process produce.

17 Q But without testing the --

18 A Without testing it --

19 Q -- aluminum --

20 A No.

21 Q -- you can't really have any basis upon
22 which you would base --

23 A No.

24 Q -- a design, right?

1 Q Have you made any effort to determine
2 whether you have ever designed a system that contained
3 the same alloy and particle size as involved in this
4 case?

5 A No. And, again, that's because I don't
6 know what the particle size of what exploded was and
7 what the chemical characteristics are.

8 Q When I look at this Deposition Exhibit
9 2 that we have identified here, I see some what looks
10 like dirt on your end of your finger. It's my
11 understanding that this was steel dust, right?

12 A That was steel dust. It was oxidation
13 off the steel.

14 Q And this was a different material than
15 the aluminum --

16 A That's different material than
17 aluminum. And we asked the operator was the aluminum
18 similar to that in construction -- or in dust, and his
19 response was yes.

20 Q And if that --

21 A I didn't document that because
22 that's -- in his opinion -- that's his opinion.
23 Whether that's truly what it was, without scientific
24 testing on it, it's not really going to help much.

1 A Exothermic.

2 Q Exothermic what?

3 A Exothermic reaction with water and
4 humidity getting into it. They were also handling
5 other materials other than just aluminum.

6 Q So the exothermic reaction that you are
7 talking about was not exclusively aluminum dust?

8 A Could have been titanium. It could
9 have been steel. You know, that was different things
10 that they processed. They had a hundred percent --
11 pretty sure they had a hundred percent aluminum
12 product, but I don't know if that product was running
13 when the dust collector burnt down.

14 Q Were you asked to evaluate the cause of
15 the explosions and fires in that situation?

16 A No. I was asked to design a new system
17 that wouldn't catch on fire and wouldn't explode.

18 Q Have you -- how many exclusively
19 aluminum dust collection systems have you designed in
20 your career?

21 A Again, a lot of times it's aluminum,
22 aluminum alloys. It wouldn't -- you know, without
23 going back and looking at what each dust was, I don't
24 know. I mean, it's --

1 Q And what do they manufacture, and where
2 are they?

3 A They are in Spartanburg, South
4 Carolina, and they -- they manufacture a wire -- a
5 bowl formed steel conduit filled with different types
6 of dust for the steel industry to fine-tune the final
7 batch on a arc furnace.

8 Q And what kind of aluminum dust do they
9 use?

10 A They actually have -- it's not the size
11 of a BB, but it's bigger than what the dust is on
12 that -- on my finger there. It's actually a dust --
13 it's actually more like a pellet, but a small -- small
14 BB. Probably a fifth the diameter of a BB.

15 Q And do you know what the minimum
16 ignition energy for that is?

17 A I have it in a -- in some testing, but
18 not off the top of my head, no.

19 Q And they had had an -- several
20 explosions before, I understand?

21 A They had fires, four fires, and two of
22 them resulted in explosions.

23 Q And what was determined to be the cause
24 of the explosions?

1 opposed to sucking up --

2 A They have different -- they have
3 different properties of actually releasing those
4 charges or conducting them away.

5 Q And you don't know whether or not the
6 hose they were using was grounded or not?

7 A No.

8 MR. HUDGINS: That's all the questions
9 I have got.

10

11 EXAMINATION

12

13 BY MR. ALEXANDER:

14 Q I am Bevin Alexander --

15 MR. HUDGINS: And thank you, by the
16 way, for your cooperation.

17

18 BY MR. ALEXANDER:

19 Q I am Bevin Alexander, and I have got a
20 few. You indicated to me that the design that you
21 performed for the company that had had multiple
22 explosions that we have heard about several times
23 today was -- the company's name was Odermath?

24 A Odermath, O-D-E-R-M-A-T-H.

1 ignition energy of the aluminum dust would be, no.

2 Q Well, for instance, does aluminum dust
3 carry a positive or a negative charge?

4 A It will conduct electricity.

5 Q All right. And PVC, do you know
6 whether that's a positive or a negative charge
7 substance?

8 A No, it won't conduct electricity. It's
9 usually plus on the inside, minus on the outside.

10 Q Did you do any studies of the
11 interaction between specifically aluminum dust and
12 PVC?

13 A No.

14 Q So you don't know whether that
15 combination was more or less likely to create sparks?

16 A Without knowing what the ignition
17 energies of the dust, you could calculate it all day
18 long and it's not going to mean anything.

19 Q So that's just not part of your
20 opinion, that aluminum dust and PVC might have had a
21 different --

22 A No. Aluminum dust --

23 Q -- capacity -- let me finish. --
24 different capacity for creating electric charges as

1 should narrow it considerably.

2 A Well, I can give you a list of hundreds
3 of bag houses.

4 Q All right.

5 A If we -- if we show up at trial, I will
6 have the list for you.

7 Q Did it factor into your opinion at all
8 that the three plaintiffs in this case testified about
9 the vacuum apparatus they were using was biting them
10 through their heavy leather gloves?

11 A Anytime that you are going to use a
12 vacuum, even in a small vacuum in your house, you
13 could end up having static electricity onto it.
14 Whether -- it doesn't have to be combustible dust to
15 have -- to be generating a static. It's anytime that
16 you are going to have material flowing through it.

17 Q Did you consider the electrostatic
18 qualities of aluminum versus PVC in developing your
19 opinion in this case? And that might not be the
20 proper --

21 A That's not --

22 Q -- term, but the -- the molecular
23 qualities in terms of charges of aluminum versus PVC.

24 A Without knowing what the minimum

1 Q I would be real interested in seeing
2 projects specifically related to aluminum dust that
3 you worked on either as a private engineer, consulting
4 engineer, or --

5 A That would take me a while to put
6 together without going back through, especially after
7 selling my business.

8 MR. BROWN: And if he is going to do
9 that, you need to be prepared to pay him for
10 the time of doing that.

11 MR. HUDGINS: Well, no. That's all
12 part of my asking him questions here. If he
13 is going to show up at trial, I am going to
14 ask him again because he has got a statement
15 here that he is responsible for hundreds of
16 bag houses. So if you don't want to give me
17 anything, that's fine, but you might be asked
18 that question again.

19 THE WITNESS: I can give you a list of
20 hundreds of bag houses that I manufactured.

21

22 BY MR. HUDGINS:

23 Q I am making it easy. I am saying
24 specifically just related to aluminum dust, and that

1 A A private consulting engineer. Lipton
2 Tea. I am doing a project right now that's got six --
3 eight bag -- eight cartridge filters on it with
4 explosion protection for the tea. I have done --

5 Q Any aluminum -- any aluminum dust
6 systems?

7 A Yep. Did the one for Odermath, which
8 was the one that had the explosions. We did the
9 recommendations and the design for those. I don't
10 think they ever put it in, but we designed it.

11 Q Any other -- any other jobs
12 specifically related to the design of systems for
13 aluminum dust as either working in private industry or
14 as a consulting engineer?

15 A I deal in a lot of different dusts.
16 Metal -- I am trying to think. It would be just
17 primarily aluminum. It's usually aluminum and other
18 components of aluminum. It's hard to say, I mean,
19 because I have done -- I have done a lot, and it's
20 been a lot of years of doing it.

21 Q I know it's late in the afternoon, but
22 nothing comes to mind here as you sit here today?

23 A No, but I can get you a list. If you
24 require a list, I can get you a list of projects.

1 remember if I did aluminum, but I did work on
2 explosive designs. I did both the manufacturing as
3 well as being responsible for engineering in our
4 design-build business, so I still did a lot of design
5 work as well.

6 Q What was your job title?

7 A Operations manager.

8 Q And who did you report to in that job?

9 A Wayne Cuthbertson was vice president.

10 Q What were the years you were there?

11 A I was there from 1981 to 1999, I think.

12 Q Any other experience that goes into
13 this statement that you have designed and been
14 responsible for the manufacture of hundreds of bag
15 houses?

16 A I mean, I have designed systems, total
17 dust collection systems.

18 Q Who, when, and where?

19 A Who, when, and where? A lot of them
20 would have had your competitor's equipment on it.
21 That would have been Torit, Nucor Steel, Pontiac
22 Foods.

23 Q And this is as a private consulting
24 engineer?

1 dust systems. Could you give me a bit of explanation
2 of that or expand on that?

3 A When I worked for Pneumafil
4 Corporation, we built reverse air bag houses, the
5 pulse-jet bag houses, and I was responsible for
6 manufacturing of those. For about six years, I ran
7 the manufacturing for it. That would have been a
8 competitor of Dustex. We built cartridge filters. We
9 built big reverse airs. Primarily, those were going
10 in the coal industry, wood industry, furniture. And
11 just about everything that we sent out the door had
12 explosion venting on it.

13 Q Any aluminum dust applications while
14 you were in that position?

15 A Any aluminum dust?

16 Q Yes, sir.

17 A We built bag houses. We built
18 cartridges that were on aluminum dust.

19 Q Were you ever involved in any specific
20 design of a system that was to handle aluminum dust
21 while you were at that job?

22 A At Pneumafil?

23 Q Yes, sir.

24 A I did other metal dusts. I don't

1 Q All right. Can you explain how he
2 could have seen through a blade that was --

3 A The blade may not have been down. The
4 blade may have been -- there may have been enough dust
5 holding it up or the blade may have had the hinge fail
6 prior to it and not allow it to close. I mean, there
7 is different explanations, but they are all --

8 Q That would be a matter of speculation,
9 wouldn't it?

10 A Yeah, speculation.

11 THE VIDEOGRAPHER: Need to change the
12 disk within the next ten minutes.

13 MR. HUDGINS: You want to do that now?

14 THE VIDEOGRAPHER: Sure, that's fine.

15 Off the Record.

16

17 (A recess was taken.)

18

19 BY MR. HUDGINS:

20 Q Mr. Schloss, I just have a couple more
21 questions about your experience. Pages 1 and 2 of
22 your report say that you have designed and been
23 responsible for the manufacture of hundreds of bag
24 houses as well as conveyance equipment for combustible

1 available.

2 Q So would your opinion change in terms
3 of where this fire originated?

4 A Again, part of what I -- what I based
5 it on was Hodges' eyewitness testimony.

6 Q You haven't tried to recreate the
7 conditions in that vent looking down to --

8 A I try not to create fireballs.

9 Q No, I am not --

10 A Or explosions.

11 Q I am not suggesting that. I am talking
12 about the ability to see down through that blast
13 damper. You haven't tried to recreate that --

14 A No.

15 Q -- those conditions, have you?

16 A No.

17 Q And so you are accepting Hodges'
18 testimony that he could see through the backblast
19 damper all the way to where the duct took a right-hand
20 turn?

21 A Yeah, because that was -- again, that
22 was prior to the explosion, you know, which is going
23 to be more reliable than after the explosion side of
24 it.

1 vacuum apparatus, that heat energy would travel in
2 both -- opposite directions simultaneously?

3 A In an explosion it's going to go equal
4 direction. It's going to find the path of least
5 resistance.

6 Q So that there would have been fire
7 coming out the end where the two plaintiffs were
8 standing on the --

9 A You would have seen a fireball -- you
10 would have seen a fireball coming out at the workers.
11 The fireball would have subsequently went the other
12 way into the dust collector. You would have seen the
13 explosion on the dust collector with a very intense
14 light on the outside of the building.

15 And, again, if you turned them around
16 and you said, okay, if you had the minor flash to
17 start with and the major flash was second, then I
18 would say it was inside the building and moved
19 outside.

20 Q Would your opinion be any different if
21 Hodges was looking and saw the fireball, but the video
22 system was inoperable so we didn't have that evidence?

23 A Again, you would have to use the
24 best -- the best evidence that you have that's

1 originating where the vacuum apparatus was creating a
2 spark and traveled in and then caused the explosion,
3 what would have been different about the video that
4 you observed?

5 A The initial -- the -- in the case of
6 that, the initial flash that would have been in the
7 building would have been larger and would have been
8 first prior to the bag house collapsing. Because the
9 fire would have went the same direction either way in
10 that duct coming back out, you would have seen the
11 inside light up. Then you would have seen the outside
12 light up and the intensity of the explosion again.
13 What I was looking at, the intensity of the fireball
14 was outside the plant, and the intensity of the
15 fireball that would have been inside the plant is what
16 I was comparing on the videos.

17 Q All right. If you accept --

18 A Because the other way around I would
19 say -- if it was the other way around, that the inside
20 lit up not to the brightness that it did, the outside
21 would have lit up later, then I would have said it
22 would have been the other way around.

23 Q Would you agree with me that had the
24 source of ignition been the spark created by that

1 out through a vent. I have calculated the forces that
2 come out from the vent that go against the wall that
3 would -- you know, in this case I didn't calculate
4 those, but it calculated as how much force was it
5 going to have against the wall, not blow the panels
6 off.

7 Q Wouldn't it be fair to say that you
8 looked at the video, and it reinforced what you
9 believed based on --

10 A No.

11 Q -- your accepting Hodges' testimony?

12 A No, because I looked at it as two
13 things, as that was taking Hodges' testimony and the
14 video was one part of it. Taking the -- the -- having
15 the fire on the inside of it versus that video didn't
16 make sense.

17 Q Now, if the fire had originated in the
18 ductwork and --

19 A We are talking hypothetically now,
20 right?

21 Q Hypothetically, if you choose to use
22 that word. -- and heat energy had traveled in the
23 direction of the normal flow of the system into the
24 bag house and caused the explosion with the fire

1 explosions and fireballs that travel from explosions
2 and, I mean, just the experience that I have in the
3 business. I am not a video expert on it. It's based
4 on what the flashes would be and what the sequence, in
5 my professional opinion, was.

6 Q But have you made a study at any time
7 in your career of thermodynamics or the nature of
8 explosions and such?

9 A I have read them. I don't -- I don't
10 sit down and do intense thermodynamics.

11 Q I mean, when you are looking at the
12 video, you are looking at it just like one of these
13 lawyers could look at it and come up with an opinion.
14 That doesn't require any special expertise, does it?

15 A No, because the opinion that I'm coming
16 up with is based on what the intensity of the
17 explosion would look like in those two -- and what the
18 fireballs would look like in those two different
19 instances.

20 Q Have you ever observed that type of
21 explosion firsthand?

22 A Not firsthand. I have seen videos of
23 explosions in bag houses. I have calculated the flame
24 ball or the fireball dimensions that are going to come

1 the building, and the secondary flash was on the
2 inside of the building, you know, which would
3 represent the fire coming down the ductwork.

4 Q Now, did you attempt to break down that
5 video into segments of seconds in terms of what you
6 could observe?

7 A I watched it frame by frame.

8 Q Did you attempt to break it down into
9 actual seconds, tenths of seconds?

10 A I don't know what -- frame by frame was
11 pretty -- I looked at frame by frame and looked at the
12 sequence in the frames.

13 Q So your opinion was based on a frame by
14 frame, and that gave you some sense of sequence and
15 time?

16 A Gave me sequence of explosions. You
17 know, whether that was a hundredth of a second per
18 frame or a thousandth of a second per frame, I don't
19 know.

20 Q What about your particular engineering
21 training gives you the ability to look at that video
22 differently from some layperson and draw conclusions
23 from it?

24 A Just in the training I have had on

1 BY MR. HUDGINS:

2 Q Those were the two that you were
3 principally concerned with. You ruled out the
4 explosion originating in the duct based upon
5 Mr. Hodges' testimony and the video. Is that fair to
6 say?

7 A Yes.

8 Q All right. Now, I want you to assume a
9 hypothetical. I want you to assume that Hodges was
10 looking the other way, didn't see any fireball. So
11 now you have got all the facts that you have
12 considered, including just the video instead of
13 Hodges' testimony. Would that change your opinion?

14 A Just the video?

15 Q Just the video. That's all you got.

16 A Yes. I mean, just the video without
17 his eyewitness thing, I would still say that the
18 explosion started in the bag house.

19 Q And tell me exactly why. How do you
20 believe -- what about that video makes --

21 A Well, because of the intensity of the
22 flash on the outside. The intensity of the flash and
23 the sequence of flashes, that the major flash was on
24 the -- was the initial one that was on the outside of

1 Q Or a blast door.

2 A To fail?

3 Q Yes, sir.

4 A I mean, that's -- you are talking about
5 apples and oranges. You say, well --

6 Q In other words, could pressure piling
7 have explained why the seams burst apart, but the --

8 A No, because there is no pressure
9 piling. There is no pressure piling involved in a
10 single unit. Pressure piling involves multiple units
11 that are connected together.

12 Q So you don't think there was any
13 possibility of pressure piling?

14 A There was no pressure -- in my opinion,
15 there are no possibility of pressure piling.

16 Q All right. You investigated two
17 possible causes for this explosion, one being the use
18 of the PVC attached to the flexible hose and creating
19 static electricity up in the duct versus the
20 exothermic reaction in the bag house itself?

21 MR. BROWN: I think he said he narrowed
22 it down to two. He went through a number of
23 them, and then came down to two.

24 THE WITNESS: Yeah.

1 pressure.

2 Q Are you familiar with the term
3 "pressure piling"?

4 A Yes.

5 Q And can you explain that for me,
6 please.

7 A Pressure piling is is if you have an
8 explosion in one vessel that's located adjacent to a
9 second vessel, that the explosive pressure in the
10 first one is going to go into the second one. If the
11 second one has any subsequent explosion, instead of
12 starting out at atmospheric pressure or slightly above
13 it, you are going to be starting out at that point
14 four bars. You will see pressure piling typically
15 where you have a cyclone ahead of a dust collector
16 where you will have an explosion either in the cyclone
17 going into the dust collector or a dust collector
18 going back into a cyclone. But pressure piling -- in
19 this case with one device and one unit, there wouldn't
20 be pressure piling would not come into play.

21 Q In general, if there is pressure
22 piling, can that cause a correctly designed relief
23 valve to fail?

24 A What relief valve?

1 size of the vent that you recommend?

2 A No. It is really based on the Kst of
3 the -- more on the Kst value than it is on anything
4 else. Because what you are looking for is you want
5 the vent to open up and relieve the pressure prior to
6 getting to the P-reduced. So the -- you want to size
7 it say at four-tenths of a bar for the closure to rip
8 apart. The explosion vents or the explosion doors
9 would typically be set at .1 bars so that it would
10 relieve that pressure. And the generation of the
11 pressure over time would give it adequate time to vent
12 prior to ripping the dust collector open.

13 Q If the P-reduced figure was greater,
14 wouldn't that justify a smaller vent area?

15 A If the P-reduced area was greater than
16 .4 or .3, that would reduce it, but I didn't see
17 anything that -- in terms of additional reinforcing or
18 additional -- versus what I am used to in a Dustex
19 bag -- Dustex bag collector has reinforcing on the
20 outside of it. When you are increasing it, you are
21 going to see reinforcing space twice as often, thicker
22 gauges. I didn't see any of that. Nor would they
23 sell. That would have been noted, I am sure, on the
24 order saying that it was designed at a higher

1 collector to withstand the Pmax. Typically, it's done
2 in the pharmaceutical industry, but you are taking a
3 dust collector that costs \$25,000 to a industrial
4 plant to, you know, half a million dollars in a
5 pharmaceutical plant. It will actually -- you design
6 the dust collector to withstand those pressures.

7 Q Where did you get your Pmax figure?

8 A I got it out of NFPA 68.

9 Q And how did you determine that the
10 figure you chose should be applied in this case?

11 A Because that was -- in the NFPA 68,
12 that was applicable at the time for sizing explosion
13 vents.

14 Q For dust?

15 A For aluminum dust.

16 Q For aluminum?

17 A Dust.

18 Q Dust. And is that powder or dust?

19 A It says aluminum dust, so I would
20 assume that's dust.

21 Q Any dust?

22 A Assume that's dust.

23 Q Now, if the Pmax figure was smaller,
24 would that affect your calculations in terms of the

1 it was designed to --

2 A Well, if you call knocking the panels
3 off the wall of the building and endangering people on
4 the other side of it, if you say that's the function
5 that you designed it for, then probably so. But --

6 Q But it contained --

7 A It wasn't in a safe -- it was not a
8 safe operation, and the explosion on it -- you do not
9 design it to have structural failure. It will be a
10 little bit different if a guy would have been standing
11 out there next to it when it fell down. Then the
12 discussion would be a little bit different. You need
13 to take safety into consideration of --

14 Q Well, you wouldn't want to have
15 somebody standing next to one of those blast doors
16 when they came sailing off there --

17 A And that's why NFPA tells you that you
18 have to put up chains around your blast door saying
19 don't stand here.

20 Q Right. Now, Pmax, what is that?

21 A Pmax is the maximum pressure that was
22 generated during the dust test, and that determines
23 how strong the explosion could be. You use it in
24 designing dust collectors in that you can build a dust

1 properly.

2 A I mean, they were calibrated at the --
3 I think 30 pounds, and that's what -- when they were
4 taken out and all the experts got around in a circle
5 and decided that was the value that those latches were
6 going to open up at.

7 Q All right. But, again, the quality and
8 maintenance of those latches is not part of --

9 A Well, again, for the amount of
10 destruction that you see in it, it wouldn't be that --
11 if the latches would have almost never had to open to
12 get the destruction forces in the tearing that dust
13 collector apart.

14 So if you had a dust collector of 200,
15 the Kst was 200, and it proved that the doors were the
16 right size and the latches were the right size, I
17 still would expect the latches to open at some point,
18 but that fail the size -- the side of the ductwork --
19 or fail the side of the enclosure of the dust
20 collector takes a lot of pressure. Actually rip the
21 metal, not ripping the wells.

22 Q Didn't this bag house -- even though
23 the seams split, didn't it basically perform its
24 function of containing the explosion to the area where

1 getting and where are you seeing that dust.

2 Q All right. Kst 415, would you agree
3 that that's a relatively high value?

4 A Aluminum is a very explosive dust.

5 Q But even for aluminum, that's on the
6 high end?

7 A No. I have seen aluminum that's higher
8 than that.

9 Q If it turned out that the actual Kst
10 was 200, would that impact your opinion in terms of
11 the suitability of this equipment?

12 A If I could find a test that showed that
13 it was 200, then I would make that determination.

14 Q And that would impact your opinion in
15 terms of the suitability of this bag plant --

16 A I would raise the question is why did
17 it rip -- even if the -- if that calculation showed
18 that was the right size door, then at that point then
19 I would be wondering why did it rip the whole unit
20 apart instead of the door just opening up.

21 Q Perhaps the failure of the latches
22 could be one explanation?

23 A Failure of the latches?

24 Q Yeah, the Brixon latches not operating

1 time it was shaved or created in the mechanical
2 process to the point where it reached the bag house,
3 would that offset the Kst value some? It would,
4 wouldn't it?

5 A It's going to change over time. How
6 fast it degrades again would have to be based on what
7 you were testing.

8 Q Isn't it prudent to do the Kst testing
9 at the point of creation as a safety feature?

10 A Yeah. Well, what you want to do is you
11 want to test it at the point of what you are going to
12 do something with it. If it's created and goes into a
13 wet dust collector, it doesn't really matter because
14 you are -- it's not going into a dry dust collector.
15 If you are collecting it at that point and it's going
16 out into a dust collector, you want to have the
17 collection out of the dust collector. When they run
18 the test, if you send them a 5-pound sample, they will
19 sift the 5-pound sample down to get only the
20 particulate that's 75 microns and smaller, which is
21 going to give you the best chance of having an
22 explosion, and it's going to simulate what you are
23 going to have in the bag house. So where you get it
24 doesn't really factor in as much as what are you

1 it was was insufficient for any applications involving
2 aluminum dust?

3 A Again, it depends on what the values of
4 aluminum dust are, what the design values or the
5 combustion values. Again, in the worst possible case
6 is what you would design it about. In NFPA 68 in 2002
7 they gave a value for aluminum dust at a Kst of 415.
8 When I did my calculations, that's what I based it on.
9 I based it on the worst case that -- the worst case of
10 available information. Again, without knowing what
11 the dust is, the most conservative way of doing it is
12 to size it at that value.

13 Q So Kst of 415, would that be more like
14 the baby powder dust that we talked about earlier?

15 A No, because you can be on -- some of
16 that dust and the powders can be up in the five and
17 six hundreds.

18 Q But Ks 415 would be a real powdery
19 material?

20 A It wouldn't have to be powdery. It
21 wouldn't have to be aluminum powder. It really
22 depends on -- you can -- it depends on the material
23 and the dust characteristics.

24 Q If the aluminum dust oxidized from the

1 handle the explosion of aluminum dust.

2 Q Do you know if they got any information
3 at all regarding Kst value?

4 A No, because I -- there was no testing
5 that I know of on the dust itself.

6 Q Do you know if they asked for it?

7 A I have -- have not seen that in the
8 documents if they have asked for that.

9 Q Do you know anything about any
10 disclaimers by Dustex based upon their inability to
11 get information regarding the Kst value?

12 A There is a disclaimer in their terms
13 and conditions that were in a letter, but that
14 didn't -- there was no -- there was no disclaimer on
15 their proposal saying that they didn't have that
16 information. That was only after the fact when it was
17 terms and conditions.

18 Q So that's the only disclaimer that you
19 are aware of?

20 A That's the only disclaimer that I saw.
21 I mean, I can look.

22 Q Now, would it be your opinion that the
23 bag house that was sold and ultimately installed at
24 Federal-Mogul with its blast door being the size that

1 Q And when you are talking about dust, is
2 there a way to quantify properties of dust with a --

3 MR. BROWN: Are you trying to find
4 something?

5 THE WITNESS: No.
6

7 BY MR. HUDGINS:

8 Q What is a Kst value?

9 A Kst is a -- Kst is actually a German
10 word that I am not sure exactly what it means, but
11 it's a calculated value. And it's -- when you run a
12 test on the explosive characteristics of dust, the
13 values that you will get is change in pressure over
14 change in time. Based on that times a cube root of
15 the volume of the enclosure will then tell you what
16 the Kst is. It's a relative number. The higher the
17 number, the more explosive the dust is.

18 Q Do you know whether or not any
19 information regarding the Kst value of the dust at
20 Federal-Mogul was given to Dustex?

21 A From the information that I saw, I
22 don't -- I don't see that. But, at the same time, if
23 Dustex knew it was aluminum dust, it was their
24 responsibility to make sure that their equipment would

1 were still set at what the factory setting would have
2 been.

3 Q So the latches on this bag house at
4 Federal-Mogul don't factor into your opinion one way
5 or the other?

6 A Well, they factor in as in the number
7 of latches and the size of the doors and how well they
8 opened up. You could have -- you could have opened
9 them up earlier with less pressure, but then you run
10 the risk of the doors just coming open by themselves.

11 Q Who was responsible for designing this
12 system based on your understanding of the facts in
13 this case?

14 A Per my understanding of the facts, it
15 was a collaborative effort between Carrington
16 Engineering, FM, or Federal-Mogul. The information
17 was transmitted to Dustex, so Dustex knew what the
18 dust was going to be in that bag house and, you know,
19 knew what the system was.

20 Q What did Dustex know precisely about
21 that dust based on your understanding?

22 A Aluminum dust.

23 Q And that's all they knew?

24 A That's right.

1 to hold the door closed in operation. But in terms of
2 an explosion, it releases and opens the latch at a
3 predetermined -- at a field-settable or
4 factory-settable limit.

5 Q And those latches can be adjusted up or
6 down in terms of --

7 A Well, you can adjust them up and down.
8 It would change the pressure, but then you would be
9 changing what the -- the Pred on the unit would need
10 to be.

11 Q All right. Were you able to inspect
12 the Brixon latches at the plant?

13 A Yes. We looked at them as a group of
14 technical experts and removed them from the door.

15 Q Were you able to determine whether or
16 not those latches had been properly maintained during
17 the term of their use at the Federal-Mogul plant?

18 A The -- I didn't have any access to
19 maintenance records on the latches or if they had been
20 maintained. They were not rusted shut. A lot of
21 times on latches similar to that, you will end up with
22 a rust that they won't open up. That the adjustment
23 screws turned easily or turned as expected to be in
24 it, and they looked to be in good condition. And they

1 I saw in their specifications it's designed to
2 withstand plus or minus 15 degrees -- 15 inches of
3 water. So, I mean, it's up to Dustex to design
4 something that's going to meet those requirements.

5 Q But that's not -- in your opinion, when
6 you say that the Dustex bag house as designed and sold
7 to Federal-Mogul was deficient for its intended
8 purpose, you are not talking about the gauge of the
9 metal. You are strictly --

10 A No.

11 Q -- talking about the size of the blast
12 doors?

13 A No, I am not talking about the gauge of
14 the metal. I am talking about the explosion
15 protection on the equipment and the results of that.

16 Q Which is the size of the blast doors,
17 and that's it?

18 A Yes.

19 Q How do the latches on those blast doors
20 factor into your opinion, if at all?

21 A The latches actually are calibrated to
22 open up at a certain pressure. So the way the door
23 operates, it's like a -- the Brixon latch is similar
24 to a industrial refrigerator latch where it's designed

1 houses.

2 Q Would you agree that they make a good
3 product?

4 A They make a product in the industrial
5 market that's equal to other competitors in that
6 market.

7 Q So, as far as Dustex is concerned, you
8 only fault the size of the blast doors that were on
9 this particular bag house at this particular plant?

10 A I felt that it contributed in part of
11 the total system as in the doors being too small would
12 have increased the explosion -- would increase the
13 total explosion pressure in it that would have caused
14 the bag house to fail, rip the ductwork down, and
15 possibly contribute somewhat to the failure of the
16 Kirk & Blum backdraft damper due to mechanical means,
17 not pressure means. I don't think that -- that the
18 damage that I saw again to the Kirk & Blum was
19 designed by mechanical or was mechanical ripping. It
20 was by pressure.

21 Q You don't fault the gauge of metal that
22 was used in this particular bag house at the
23 Federal-Mogul plant, do you?

24 A That's up to Dustex to design a system.

1 think approximately double in size, do you have an
2 opinion as to whether or not there would have been any
3 heat energy that would have traveled in a reverse flow
4 back up the ductwork in any event?

5 A It's an explosion. It's going to go up
6 that duct. It doesn't -- it doesn't look at it and
7 say, well, oh, here is a door that I can blow open.
8 Let me wait until the door opens up, and then we will
9 all go out there.

10 It still went through the fan. It went
11 back through that duct, went down into the 55-gallon
12 drum. And that's why NFPA requires that you isolate
13 all those to eliminate a future problem.

14 Q So there would have been a fireball
15 going back toward those two plaintiffs on the scissor
16 lift in any event?

17 A In any event, you would have had a
18 fireball going back through there because you had an
19 explosion in the bag house, yes.

20 Q Now, as far as the bag house that was
21 manufactured and sold by Dustex, you are not here to
22 say that that bag house was -- was a bad product for
23 all applications, are you?

24 A No. I have installed Dustex bag

1 That's why NFPA requires that you have
2 minimum conveying velocities in your ductwork so you
3 do not have a buildup of dust anywhere in those
4 systems.

5 Q So what I was getting to is: Do you
6 have an opinion as to whether or not there was any
7 combustion of material that was in the ductwork
8 between the backblast damper that we have talked about
9 today and the open end where the two plaintiffs were
10 standing?

11 A In my opinion, yes, there would be
12 combustion because you have fresh fuel and you have --
13 but it wouldn't be dependent -- dependent on them
14 stirring it up. You are looking at a pressure wave
15 that's moving at the speed of sound is a lot -- is
16 going to generate a lot more turbulence and a lot more
17 dust pickup than anything they could do with that
18 lance.

19 Q All right. Now, as I understand your
20 expert opinion with regard to Dustex, you believe that
21 the blast doors were too small for this application?

22 A My calculations show they were.

23 Q All right. Had the blast doors been of
24 the size that you specify in your report, which were I

1 the unit ripped open, the fireball went out the side
2 of it. So all these places that relieved as well as
3 when the backdraft -- backblast damper blew apart,
4 that was another source of relieving that pressure.

5 Q All right. In your scenario, in the
6 process that you have described, heat energy traveled
7 back up and back out the ductwork to where the -- two
8 of the plaintiffs were on a scissor lift?

9 A Uh-huh.

10 Q And that's where they were injured?

11 A Plus, you had fresh fuel in that line
12 as well.

13 Q And that was my next question. Do you
14 have an opinion as to whether the fresh fuel in that
15 ductwork where they were pushing around a vacuum and
16 stirring up dust, presumably, whether that dust
17 combusted when the heat energy traveled back up and
18 through the ductway in a reverse direction?

19 A Whether they were stirring it up at
20 that time or if the ductwork was connected, the energy
21 would have went along that and picked up the surface
22 dust and had the same result of a fireball going down
23 the duct. Instead of coming out into people's faces,
24 it would have came out into the production equipment.

1 have been in this bag house with the particular
2 material that was in place there?

3 A I would know -- I would know if they
4 had had it tested.

5 Q But you didn't get a sample, so you
6 don't know?

7 A And it was never tested prior to the
8 explosion.

9 Q So you do agree that you don't know?

10 A I agree that I don't know, but it's
11 information that if you did have it, you would use it
12 in your evaluation.

13 Q All right. Now, in your scenario, the
14 explosion began in the bag house, and there were --
15 was a shock wave and then followed by a fireball that
16 traveled back through the ductwork and back through
17 the -- and pushed open the backblast damper and went
18 through the ductwork and burned the plaintiffs?

19 A Well, it took many paths. The same
20 fireball could have went -- the same fireball would
21 have went down into the 55-gallon drum. The same
22 fireball would have went out through the fan.
23 Anyplace -- the same fireball -- when the vent did
24 open up, the fireball went out it. When the side of

1 Q And given the type of material, this
2 aluminum dust and shavings from the Federal-Mogul
3 industrial process, what temperature would have to be
4 reached for that material to combust?

5 A Again, that's -- would be the chemical.
6 It's part of the chemical test with the minimum
7 ignition temperatures. Again, if you had the material
8 tested prior to the explosion, that would be available
9 and you could do it, but that changes by each type of
10 dust. Aluminum could have a range of minimum ignition
11 temperatures based on the particle size. Again,
12 without having the dust, you wouldn't know.

13 Q So is the answer --

14 A I guess -- let me finish. The other
15 thing, when you were talking about shavings, shavings
16 typically refer to a larger -- a larger particulate.

17 If you look at -- on the exhibit I had
18 on Number 2, I asked the guy who ran the machine at
19 the time if that was typical of the dust that they
20 saw, and he agreed it was. I think Doug Edwards was
21 with me at the time. And that's not shavings. That's
22 dust.

23 Q All right. But is it fair to say that
24 you don't know what the combustion temperature would

1 drum. I don't know if the 55-gallon drum was full and
2 backed up into the hopper or if the 55-gallon drum was
3 half empty.

4 Q Did you see a drum as part of your
5 investigation?

6 A I did not take pictures of the drum. I
7 don't remember if the drum was available. I don't
8 think it was.

9 Q Now, in an exothermic reaction,
10 hydrogen gas is produced. And an explosion can occur
11 either with the hydrogen reaching a sufficient
12 temperature to combust, or the material can get hot
13 enough to combust; is that --

14 A Yes.

15 Q And, again, I am a lawyer. I am not a
16 chemist or a fire expert.

17 A Yes.

18 Q But is that -- am I correct in that --

19 A You are correct.

20 Q -- belief? And it's your opinion that
21 it was not hydrogen gas that combusted here, but it
22 was the material itself that got hot enough to
23 combust?

24 A Yes.

1 accumulation at any particular point in that hopper?

2 A I didn't investigate exactly where that
3 point would be in the hopper or in that dust
4 collector, no.

5 Q And you didn't do any test to determine
6 how the angle of the hopper might affect the
7 particular material that was --

8 A Without having the -- without having
9 the material and the characteristics of the material
10 -- you can run a test where you can test what the
11 angle of repose is, when it will start to become
12 free-flowing. Without the material available, it's
13 not possible to do that test.

14 Q The bag house is designed so that the
15 material collects and goes down the slopes of the
16 hopper into a steel drum?

17 A Yes.

18 Q Now, the explosion didn't start in the
19 steel drum, did it?

20 A Again, I didn't -- I didn't pinpoint
21 where it could have started. You have a lot of fuel
22 into it. My understanding from the information was
23 that in the time it was -- at the time that they ran
24 the dust collector, they never emptied the 55-gallon

1 Q You haven't --

2 A I mean, other than looking at the
3 damage and the -- the damage to the bag house and the
4 position of the cages on the bags. I would -- my
5 assumption was or my opinion was it was in the hopper,
6 but to say that it was in a hopper in four inches of
7 dust, no.

8 Q All right. Now, for an exothermic
9 reaction to occur, there has to be sufficient
10 accumulation of the material that then combines with
11 H2O to cause the reaction?

12 A Yes.

13 Q Where in the hopper, according to your
14 experience, would there be --

15 A Anywhere.

16 Q -- a place where there would be
17 sufficient accumulation?

18 A Anywhere in that hopper. Depends on
19 whether the material falls down. If the angle of
20 repose of the material doesn't slide, you may end up
21 with two or three inches of material around the entire
22 hopper.

23 Q In this case, in this particular case,
24 you don't have any idea that there was sufficient

1 A I mean, that's past my area of
2 expertise in that I understand how they -- you know,
3 the -- I understand dust collectors and explosions and
4 exothermic reactions. I am not a trained fire
5 investigator that says here is an acceleration mark
6 and here is where it moved up the side of the hopper.
7 That's not what -- my expertise.

8 Q That would take a cause and origin
9 expert?

10 A Which I am not, other than the cause
11 side of -- cause and origin as in general location,
12 but not specific that it started three feet up the
13 hopper right here.

14 Q So it's your opinion that there was an
15 exothermic reaction that caused an explosion somewhere
16 in the bag house, but you don't have an opinion as to
17 where that might have been?

18 A Where the point of origin is or the
19 explosion?

20 Q Where it started, where the actual
21 reaction occurred that --

22 A No.

23 Q -- caused this explosion.

24 A No.

1 questions for now. Thank you for your time.

2

3 EXAMINATION

4

5 BY MR. HUDGINS:

6 Q Mr. Schloss, I am next. I am David

7 Hudgins, one of the lawyers for Dustex Corporation.

8 Did you make a determination as to the precise point

9 of origin for the fire that started the explosion in

10 the bag house?

11 A Define precise.

12 Q Where exactly was the source of

13 combustion in the explosion that you believe started

14 this chain of events?

15 A As in -- no, not into the context of it

16 was in the hopper two feet up and three feet over. I

17 didn't do a, you know, analysis of where the fire was

18 or where the fire originated into it.

19 Q All right. You had a chance to look at

20 the bag house itself, albeit some time after the

21 explosion?

22 A Yes.

23 Q You didn't try to determine where

24 inside that bag house the point of origin of this --

1 was based on, the depositions and, you know, invoices,
2 design information, specs like that, but nothing that
3 says here is what your findings need to be.

4 Q Oh, no. And so you are clear on what
5 my question is about, I understand that they provided
6 you with documents, including deposition transcripts,
7 the exhibits to the depositions, and other materials.

8 What I am asking about is: During your
9 conversations with them, did they provide you any
10 information from them to you orally that you used to
11 rely upon in your report?

12 A I think the only thing, and we have
13 already discussed it, is just the operation hours of
14 the plant, was a question I asked about it. But other
15 than that, no.

16 Q Okay. And just to be clear, because I
17 may not remember when we went over that --

18 A It was a half hour to an hour and a
19 half that it was shut down prior to the incident.

20 Q That's information that you received
21 from them?

22 A That's the only thing I can think of
23 that I received in an oral basis.

24 MR. MORRIS: Okay. That's all my

1 MR. MORRIS: I think it's the same as
2 whether or not your client has had a
3 conference with an attorney. You can ask
4 whether it occurred, not what the contents of
5 it was. But it's not that crucial to me. I
6 will move on.

7 MR. BROWN: Okay.

8

9 BY MR. MORRIS:

10 Q Okay. You indicated that you did not
11 bring with you today any notes or other documents
12 other than your report and the documents that you
13 reviewed. Do you have a separate file regarding this
14 matter which you keep in your office?

15 A Everything I have if I got information
16 from Mr. Brown or Mr. Johnson was all electronic, so
17 it's all reading. Reading a .pdf, don't print much,
18 so -- I mean, I don't print it because I can't keep up
19 with it, so...

20 Q Were Mr. Brown or Mr. Johnson the
21 source of any specific information that you relied
22 upon in reaching your opinions as expressed in your
23 report?

24 A Just the information that the report

1 A I don't know what -- I guess -- I don't
2 know what information he had.

3 Q Did he provide you with any information
4 during that conference call?

5 A No. No.

6 Q Have you consulted with anyone to
7 assist you in the preparation of your report?

8 A No.

9 Q Did you prepare any drafts of your
10 report before producing the final report that was
11 provided to the defendants?

12 MR. BROWN: Don't answer that question.

13 MR. MORRIS: Based on?

14 MR. BROWN: Based on the Federal Rules.
15 Federal Rules were changed about two years
16 ago, and that's not a proper subject of
17 inquiry. Any draft reports are privileged
18 and are attorney work product specifically by
19 the Rules.

20 MR. MORRIS: I understand we are not
21 entitled to get them. I am asking whether or
22 not he prepared any before his final report.

23 MR. BROWN: I don't think you get to
24 inquire into that.

1 A No. It was Mr. Johnson and Mr. Brown
2 as well.

3 Q When was that?

4 A I'd have to look. Somewhere around the
5 beginning of September. I don't know if they -- they
6 probably have better dates and better ideas, but...

7 Q Within the last three months?

8 A Yes.

9 Q And did Mr. McGinley provide you any
10 information that you used in preparing your report?

11 A No.

12 Q Did you express any disagreements with
13 Mr. McGinley regarding any opinions that he expressed
14 during that conference?

15 A No. I mean, it wasn't a conference
16 where we were discussing opinions.

17 Q What was the conference about?

18 A It was more logistical, making sure
19 that we had all the information.

20 Q Okay. Was there any information that
21 you had that Mr. McGinley did not?

22 A I don't recall. I don't -- I don't
23 think so. I think we had similar information.

24 Q Any information --

1 Q In your expert disclosure, you provided
2 us with a copy of your CV?

3 A Uh-huh.

4 Q Is that current, or are there any
5 additions you need to make?

6 A I am now a licensed engineer in the
7 state of Arizona as well, and I sold my business to a
8 firm in Greenville called Synterra, S-Y-N-T-E-R-R-A.
9 Now I am an employee of Synterra in the middle of a
10 working transition from one business to the next.

11 Q Okay. And as I am sure you know, the
12 trial for this case is scheduled in February of 2014.

13 A Yes.

14 Q And do you plan on attending in person
15 for that trial?

16 A Yes.

17 Q Have you had any contact with Patrick
18 McGinley regarding his opinions in this case?

19 A No. I have not seen his final report.
20 We had a meeting on Skype, but I think he was at the
21 point of putting his opinions together. I have not
22 seen what his final report was.

23 Q Was it just you and Mr. McGinley during
24 that conference?

1 So without having that --

2 Q Which we don't have.

3 A Which you don't know, so again you are
4 guessing and using an assumption in doing it. But the
5 difference between, you know, 15 milliseconds and 20
6 milliseconds isn't a lot of difference.

7 MR. MORRIS: I want to take a quick
8 break.

9 THE WITNESS: Okay.

10 THE VIDEOGRAPHER: Off the Record.

11

12 (A recess was taken.)

13

14 BY MR. MORRIS:

15 Q Mr. Schloss, we are back after a short
16 break. And usually when I ask for that break, that
17 means I am getting very close to the end of my
18 questions, but there is three other attorneys that
19 will come after me.

20 I want to ask you, have you been asked
21 by plaintiffs' counsel to prepare a report addressing
22 the opinions that were provided by the defense experts
23 in this case?

24 A No, I have not.

1 determine what the rate of propagation for the flame
2 was?

3 A No, not on this specific case, no.

4 Q Okay. Is there a set formula that you
5 would use for that?

6 A Deflagration is a flame front moving at
7 less than the speed of sound. The speed of sound is
8 quite high, so it's going to move very quickly through
9 that ductwork.

10 Q So between the time that Mr. Hodges
11 says he sees the fireball and the time that it reaches
12 the open end of the duct where he is standing, can
13 you --

14 A Milliseconds.

15 Q Well, okay. Based on your experience
16 and to a reasonable degree of engineering probability,
17 can you tell us how long it would take for the
18 fireball to get to Mr. Hodges --

19 A I can calculate it, but I don't have it
20 with me here.

21 Q Okay.

22 A But I can calculate you -- calculate
23 that. Again, the rate of the fireball is also
24 dependent on the chemical characteristics of the dust.

1 already done. The whole explosion is going to take --
2 and NFPA shows this. Chilworth shows this. In
3 three-tenths of a second -- from the time it starts
4 until the time a building could come down is about
5 three-tenths of a second.

6 Q Now, assuming for the purposes of this
7 question that the alternative theory that you
8 considered, that the explosion started in the ductwork
9 as a result of sparks from the static electricity, the
10 explosion there would create a pressure wave as well,
11 correct?

12 A If you had an explosion in the
13 ductwork? If you have an explosion anywhere, you are
14 going to get a pressure wave and you are going to get
15 a fireball.

16 Q Okay. Would that pressure be
17 sufficient to force open the backblast damper flap?

18 A It would lift it up because the
19 ductwork that you are talking about having the
20 explosion in is prior to that damper. So it would
21 open up -- it would force it open. It's not going to
22 stop an explosion in the ductwork.

23 Q Now, you just referred to how quickly
24 this explosion occurred. So can you tell us, did you

1 fails, what's the impact on the other one failing.

2 So when I looked at both of these, I
3 looked at did the failure -- did the failure of the
4 bag house cause the backdraft damper to fail? And in
5 my conclusion, it did not, that they failed equally
6 during the explosion.

7 Q And so that I am clear, the presence of
8 the 4 to 5 inches of dust is not relevant to that
9 opinion?

10 A It would have -- again, passing the --
11 passing a flame front and withstanding an explosion
12 are two different things. Closing against 4 and 5
13 inches of dust is going to isolate an -- is going to
14 isolate a flame front. In the isolation of having the
15 construction of the damper be able to withstand that
16 pressure doesn't really involve passing that flame
17 front or not.

18 Q If that flap is partially open, it will
19 withstand some of the pressure, correct? It would --

20 A Well, no. It would still withstand a
21 very, very small portion of it, but you are talking
22 about an explosion that's taking place in less than a
23 tenth of a second. This isn't a gradual looking at it
24 and saying, oh, I think it's going to explode. It's

1 BY MR. MORRIS:

2 Q -- as this one did?

3 MR. BROWN: Before you answer that
4 question, I'd like to interpose an objection.
5 The appropriate standard is engineering
6 probability and not certainty. You can --

7

8 BY MR. MORRIS:

9 Q I apologize again, and I adopt
10 probability.

11 A Engineering probability of it is that
12 it would withstand that. Because it's designed at .4
13 bars of pressure, it has a factor of safety built into
14 it the same way the bag house does. The bag house may
15 have .4 bars of pressure, has a reduced pressure, but
16 the ultimate pressure before things start tearing
17 apart is 33 percent greater than that. So it would
18 have withstood a larger -- a -- it would have
19 withstood a larger explosion or more intense explosion
20 than the existing backdraft damper.

21 So my opinion, more than likely, in
22 engineering certainty, is it would have withstood that
23 pressure. The bag house and the backdraft damper
24 again need to be looked at as a system, because if one

1 That's called for in NFPA. It says all components
2 shall be designed at the anticipated pressure.
3 Anticipated pressure in a dust collection system like
4 this would be at what pressure is the bag house
5 selected to actually work at, so...

6 Q And now -- so my question to you here
7 is: As you sit here, I think, as I understand it, you
8 can't say specifically what the construction of the
9 backblast damper should have been for this system
10 because you don't have the sufficient information to
11 make that determination; is that correct?

12 A I could design you a backdraft damper
13 that would withstand that pressure, and it would be
14 much heavier gauge than what you -- than what was
15 furnished by Kirk & Blum.

16 Q And as you sit here, however, based on
17 the circumstances that occurred in this explosion, can
18 you say to a reasonable degree of engineering
19 certainty that a -- that a backblast damper that was
20 constructed to the same pressure point as the bag
21 house, if that's a fair way of stating it, would have
22 not blown out on the side --

23 MR. BROWN: Before you answer that --

24

1 A The configuration of it?

2 Q Well, the makeup, the construction,
3 the --

4 A The makeup and the construction in a
5 dust collection system at an industrial plant similar
6 to what we are talking about right here, not
7 somebody's air-conditioning ductwork system that's got
8 a filter in it or something, but a filter that would
9 be manufactured by a company like Dustex would
10 typically be designed between .3 and .4 bars of
11 pressure. And that is Pred, or the reduced pressure,
12 is what can the closure withstand.

13 Once that value is set, then all the
14 components of the system would then have to be capable
15 of withstanding that. Because when the bag house
16 explodes and it sees .4 bars of pressure before the
17 relief for the chemical suppression goes off, all the
18 components are going to see .4 bars. That's why when
19 you design these things, everything has got to be
20 designed as one total system.

21 So the pressure should have been -- the
22 pressure of the components other than the bag house,
23 even the ductwork between the isolation damper and the
24 bag house, need to be designed at that pressure.

1 the bag house walls?

2 A That was used as an example. It's not
3 a hard and fast rule that it's got to have the same --
4 it's got to be designed at the same pressures. Bag
5 houses typically are designed 11- and 12-gauge. These
6 dampers are typically designed 11- and 12-gauge.

7 Q Based on the fact that we see the bag
8 house here blew apart in its wall, do you have an
9 opinion as to whether or not a heavier gauge in the
10 backblast damper would have also blown apart under the
11 pressure of this explosion?

12 A Without knowing what the pressure on
13 the explosion would have been at that point, other
14 than it was greater than what the design pressure of
15 both the relief vents and the explosion vent, I
16 couldn't answer that.

17 It may have been at what the correct
18 design should have been, and it would have worked. It
19 may have been higher than that. It may have been
20 lower than that.

21 Q So, based on your experience, can you
22 say based on your evaluation of this system what the
23 configuration of the backblast damper should have
24 been, in your opinion?

1 context, in talking about a fan, means a blast of air.
2 But in terms of a backblast damper in 2002, it refers
3 to explosion. Is that --

4 A Yes.

5 Q -- what you are testifying to?

6 A Yes.

7 Q Okay.

8 A It's what's the device used for in that
9 -- in the position that it was in was to isolate the
10 explosion from coming back into the plant --

11 Q I'm sorry, Mr. Schloss. You answered
12 my question. I didn't ask for an explanation as to
13 why you answered yes.

14 A I'd like to give you an explanation.

15 Q Well, your counsel can ask you that
16 question. I have got my answer, so I am going to move
17 on. Going back to again the fact that the ordered
18 part was delivered by Kirk & Blum to Federal Mogul as
19 ordered, in your report you indicate again that a
20 heavier gauge backblast damper would have been
21 appropriate for this system, correct?

22 A Yes.

23 Q And in your report you indicate that
24 the backblast damper should have the same thickness as

1 BY MR. MORRIS:

2 Q What should it be called?

3 A Blast -- backblast damper.

4 Q Okay. And are you aware that an
5 air-control damper or a cut-off or balancing damper is
6 sometimes called a blast gate?

7 A Yes. And if you look in Kirk & Blum's
8 catalog, that's what they are called.

9 Q And -- and that's not an explosion
10 containment device, is it?

11 A No.

12 Q And can you define what the blast
13 positions of a fan outlet are?

14 A Sure. You have up blast, down blast,
15 top horizontal discharge, top angular up, bottom
16 angular down. There is a lot of -- definitions are
17 all in AMCA. And the blast positions on fans really
18 have nothing to do with a blast coming off an
19 explosion vent.

20 Q That refers to just a blast of air?

21 A That's a nomenclature used to identify
22 the rotation of a fan, nothing to do with explosion
23 protection.

24 Q So when you use -- so blast in that

1 (Deposition Exhibit Schloss 16 was
2 marked and entered into the Record.)
3

4 MR. BROWN: Let the Record show that
5 the invoice that was referred to by the
6 witness was Deposition Exhibit Number 16, and
7 the diagram that was referred to by the
8 witness was Deposition -- now marked as
9 Deposition Exhibit Number 15.
10

11 BY MR. MORRIS:

12 Q In your report, do you state that the
13 Kirk & Blum backblast damper contains a blast gate?

14 MR. BROWN: Can you give me a page
15 number, please.

16 MR. MORRIS: 19, four sentences from
17 the bottom.

18 THE WITNESS: That's an error on my
19 part. That should say blast back -- a blast
20 gate is a different device. A blast gate is
21 a balancing device used in balancing the
22 airflow in a system. That's just a error on
23 my part in calling it that.
24

1 damper. This is a Kirk & Blum backblast damper, in
2 line, from 4 to 18 inches. It's 18-gauge. This
3 damper, as I see it here, was the damper that I looked
4 at, similar construction, similar dimensions. I did
5 not check plus or minus, you know, quarter of an inch
6 whether it was still the same size, but...

7 Q So a straight line --

8 MR. BROWN: Time out because you
9 referred to this, and I would ask that it be
10 marked so we have a clean record, can be
11 followed.

12
13 (Deposition Exhibit Schloss 15 was
14 marked and entered into the Record.)

15
16 MR. ALEXANDER: Brent, he also referred
17 to that invoice.

18 MR. BROWN: Pull out the invoice too,
19 please.

20 THE WITNESS: Want the full invoice?

21 MR. BROWN: Sure.

22 MR. ALEXANDER: The page you referred
23 to.

24 THE WITNESS: Do you need to see that?

1 Q And based on the order form, is the
2 part that was installed or delivered to Federal-Mogul,
3 is that what was on the order sheet?

4 A Again, I didn't work for Kirk & Blum or
5 have the information of what Kirk & Blum's -- other
6 than what was provided --

7 MR. BROWN: You can look at that.

8 THE WITNESS: Which was a sketch at the
9 -- that was provided on in-line backdraft --
10 backblast damper.

11

12 BY MR. MORRIS:

13 Q We don't have to mark that as an
14 exhibit unless you need to.

15 A Do you want to see it?

16 Q No.

17 A But if looking at this, looking at
18 their invoice -- let me find the invoice. It said
19 14-inch KB backblast damper, which I am assuming --
20 again making an assumption based on the information
21 that it matches the drawing that says Kirk & Blum
22 backdraft damper.

23 This is -- that's Kirk & Blum's invoice
24 to Carrington Engineering calling for a backblast

1 A Yes, and it needed to withstand the
2 anticipated pressure of the explosion.

3 Q And do you know whether or not in 2002
4 whether or not Kirk & Blum manufactured such a
5 product?

6 A To my knowledge, I wasn't employed by
7 Kirk & Blum in 2002, but when I dealt with that damper
8 design was later --

9 Q Again, I am asking do you know --

10 A Not in 2002.

11 Q Do you know whether or not --

12 A I do not know in 2002 if they made a
13 heavier damper.

14 Q Okay. Based on your review of the
15 documents involving the purchase order for the parts
16 from Kirk & Blum, was there a -- an order for a
17 heavier gauge backblast damper than the one that was
18 installed at Federal-Mogul?

19 A To know what that description was
20 versus what was furnished, I don't know.

21 Q Okay. Well, you said that you had
22 reviewed the invoice or the purchase order, the
23 documents of Kirk & Blum?

24 A Yeah.

1 it -- well, withdrawn.

2 With respect to the hinge itself, okay,
3 do you have any information as to whether -- what the
4 condition of that hinge was prior to the explosion?

5 A Prior to the explosion, no. After the
6 explosion was on the ground, this picture shows it.
7 Do you want to put this into evidence?

8 MR. BROWN: Yes.

9 THE WITNESS: Exhibit?

10

11 (Deposition Exhibit Schloss 14 was
12 marked and entered into the Record.)

13

14 BY MR. MORRIS:

15 Q As part of your opinion, you stated
16 that it is your opinion that a backblast damper of
17 heavier construction should have been used in this
18 system; is that correct?

19 A There are backdraft dampers --
20 backblast dampers that are commercially available that
21 are heavier construction that will meet NFPA
22 requirements.

23 Q When you refer to NFPA requirements,
24 was there a requirement in 2002, a --

1 materials that you previously reviewed. Were you able
2 to find any pictures that indicated that the backblast
3 damper remained in its position subsequent to the
4 explosion and the collapse of the bag house?

5 A From the pictures, the backdraft damper
6 was not still up in the air. But there is a picture
7 of the backdraft damper on the ground, and it shows
8 the same damage as the pictures we took during the
9 visit where you can see where the blade does not match
10 up with the hole and that the side is ripped.

11 So I think if there was any mishandling
12 between the time of the explosion and, quote, being in
13 the dumpster, it would have shown up on those pictures
14 there.

15 Q Well, my question is: Just from it
16 falling to the ground --

17 A By falling to the ground --

18 Q -- could that cause -- could that cause
19 any damage to the backblast damper?

20 A Not to the extent that the backdraft
21 damper experienced.

22 Q Is there any indication that you have
23 as to whether or not the condition of that backblast
24 damper was different than it appears when you saw

1 results of the explosion, and I don't think -- again,
2 in my opinion, that was not the result of mishandling
3 of that equipment. When it's in two or three pieces
4 and bent all up, that's not mishandling. That's a
5 result of an explosion. That's based on my
6 experience.

7 Q Well, the location of the backblast
8 damper was approximately 20 feet above the ground?

9 A Yes.

10 Q Okay. And during the explosion, that
11 ductwork all fell to the ground, correct?

12 A I think part of that ductwork fell to
13 the ground based on the pictures. Let me review.

14 MR. BROWN: Can I see the exhibits?

15 MR. MORRIS: Sure.

16 MR. BROWN: Take a minute. I want to
17 make copies.

18 THE VIDEOGRAPHER: Off the Record.

19

20 (A recess was taken.)

21

22 BY MR. MORRIS:

23 Q Mr. Schloss, you have had an
24 opportunity to look through the pictures and the

1 BY MR. MORRIS:

2 Q Okay. Now, the pictures that you are
3 referring to here were ones that you took you said in
4 August 2013 on your first visit to --

5 A Yes.

6 Q -- Federal-Mogul. And the backblast
7 damper at that time was kept in a dumpster, correct?

8 A Yes.

9 Q Okay. And that was some two years and
10 nine months after the explosion occurred, correct?

11 A Yes.

12 Q Based on your examination of the
13 backblast damper in August of 2013, can you state with
14 a reasonable degree of engineering probability that
15 the condition of the backblast damper as you have
16 described it was the result of the explosion compared
17 to any other possible causes for damage?

18 A In my opinion without a doubt, what's
19 shown in those pictures is indicative of what it
20 looked like during the explosion. Again, it wasn't
21 handled to the point of being able to rip the top off
22 of it or rip a blade out of the side of it. Those --
23 my review of the information or of the backblast
24 damper at the time when I was there was looking at the

1 A I'm sorry, Number 4. Number 5 you can
2 see that it's offset and that the hinge -- the hinge
3 has released, and this is out of the way. You can see
4 the gaps around the blades. This is again -- Picture
5 Number 6 is a picture of the unit.

6 Q Do you want to hold it up for the
7 camera as you do that?

8 A (Witness complies.) Picture Number 7
9 again shows the general construction of the damper and
10 the location of the blade. Picture Number 8 shows the
11 damper as well and where the side of the unit in this
12 case has become separated.

13 THE VIDEOGRAPHER: It didn't show that
14 well.

15 THE WITNESS: I'm sorry. Picture
16 Number 9 again shows the alignment of the
17 blade versus the hole. Picture Number 10
18 shows the blade itself and the alignment.
19 Picture Number 11 again is the blade with the
20 alignment, same as -- similar -- all these
21 pictures are just a little bit different
22 views. Picture Number 12. And Picture
23 Number 13 is the damper with the blade lifted
24 up to show the condition of the seat on it.

1 Q And then you can refer to them by
2 exhibit number.

3 A All right.

4
5 (Deposition Exhibits Schloss 3 through
6 13 were marked and entered into the Record.)

7
8 BY MR. MORRIS:

9 Q Mr. Schloss, back on the Record. After
10 my last question, you indicated that you wanted to use
11 some pictures in order to be able to discuss the
12 backblast damper and specifically the condition of the
13 hinge; is that correct?

14 A Yes.

15 Q And we have now marked as Exhibits 3
16 through 13 photographs that you took?

17 A These are photographs that I took in
18 August. That's the hinge in question. You can see
19 that it's not intact. You can also see it in this
20 one --

21 MR. BROWN: Say which one is this one.

22
23 BY MR. MORRIS:

24 Q That's why we have numbers.

1 talking about putting a light piece of ductwork or
2 something to make an explosion panel out of a piece of
3 ductwork. That's not talking about that you can build
4 a flimsy dust collector and say, well, it blew apart
5 and that's how we kept the explosion.

6 Q Was the blowing of the side -- not the
7 flap, but the side blowing out on the backblast
8 damper, was that a means of ventilation for this fire
9 as well?

10 A Yeah. Whenever the pressure built up,
11 it both tore the bag house apart and blew the
12 backdraft damper apart.

13 Q So it pushed out the side, but it did
14 not -- but that same pressure did not have the effect
15 of destroying the flap?

16 A It knocked the flap off the hinges at
17 one point in the --

18 Q Where?

19 A Hinges were not fastened all the way
20 across the top of it. I think I have got a -- in this
21 group of pictures.

22 Q Let's do this: If there is pictures
23 you want to refer to, let's mark them first.

24 A Okay.

1 A Well, I mean, those are my -- throw out
2 all the assumptions and change it to my professional
3 opinion is just --

4 Q No, I understand. But to reach your
5 opinion, you made the assumption that, regardless of
6 whether or not the flap was propped open or closed,
7 that the backblast damper allowed fire to pass into
8 the ductwork beyond it and into the building?

9 A Yeah.

10 Q That's your opinion?

11 A And even in quoting Doug Edwards, in
12 his report I think it mentioned that it was better
13 than having nothing there. Could have been a lot
14 worse if nothing was there in that damper.

15 Q A little out of context, but yes.

16 A Not really out of context, I don't
17 think.

18 Q Well, I will ask it -- I will go to a
19 different area for that then too. Are you aware that
20 NFPA 484, as it was at least in 2002, allows the use
21 of lightweight construction as a deflagration device
22 for aluminum dust systems?

23 A As long as it doesn't impact -- as long
24 as it doesn't impact the safety of the system. That's

1 hinge wasn't a hundred percent intact. Whether that
2 was damaged during the explosion or handling or
3 whatever else, I don't know.

4 Q Fair to say, though, the flap itself
5 was in -- was intact?

6 A It was intact. Whether it stopped the
7 explosion, I could not guarantee that.

8 Q Well, based on your prior testimony of
9 how this works, that it's the pressure wave coming
10 from the explosion before the fireball that would
11 force that closed and that, in your opinion, that the
12 dust pile wouldn't affect that ability because the
13 pressure would be enough to force it closed --

14 A I think --

15 Q -- anyway --

16 A Yes, it would press it closed. Again,
17 whether that's -- whether that pressure -- you
18 wouldn't need much of a crack around that damper to
19 allow it to go -- the fireball to go around it. When
20 I looked at it, in my opinion, even if it did close,
21 it didn't close to the point that it stopped the fire
22 from going past that and down the ductwork.

23 Q Okay. Well, I hear a lot of
24 assumptions in there, okay?

1 question that will get a more direct answer, okay? Do
2 you think that the pile of dust and debris that was
3 present as described by Mr. Hodges hampered or reduced
4 the operation of the backblast damper?

5 A In my professional opinion, it didn't
6 hamper it. It didn't -- the pile of dust -- again,
7 you are talking about the pressure wave pushing a
8 piece of quarter-inch plate against it. That --
9 whether that would move it out of the way so that it
10 was a hundred percent sealed, I couldn't guarantee
11 that.

12 Q If it didn't hamper it and it was
13 pressed completely closed as you have described -- we
14 know that it was blown out on the side, okay? -- then
15 what's your explanation for why the flap wasn't
16 damaged?

17 A Again, the flap is made out of much
18 heavier steel than what the casing is. The flap I
19 think is -- the gauge is 18 gauge, and I think the
20 blade was quarter-inch, so you are talking about quite
21 a bit of difference in terms of what it was.

22 The hinge was torn at the top, wasn't
23 closing back against it and making that seal. That
24 was when I did the inspection side of it, that the

1 to take it and slam it shut prior to the fireball
2 getting there. Because what will happen is is the
3 pressure will go -- there will be some pressure that
4 went by it. You don't want fire going by it.

5 In the construction in that unit, you
6 have two concerns. One is the strength of the blade
7 to be able to stop against that, and the other is the
8 strength of the housing to be able to contain it while
9 it's doing it. The strength of the blade would be
10 adequate to force the dust out of the way and get it
11 to seep. I mean that it may -- it may seep 100
12 percent. It may seep 95 percent. You know, the
13 housing is what came ripping apart whether -- and, in
14 my opinion, when the housing comes ripping apart, it
15 also would allow additional fire to go past that
16 backdraft damper just due to the stresses on the
17 inside of the -- of the -- on the inside of the blade.

18 So to answer your question onto it is
19 that the dust is in the -- in the damper and the --
20 due to the size and the consistency of the dust, there
21 is more than likely chance that it moved all that dust
22 out of the way because you are talking about a force
23 against it that's quite high to get that to seal.

24 Q So let's see if I can ask a more direct

1 accumulation of dust and debris. Do you have an
2 opinion as to whether or not that affected the work of
3 that part during this explosion?

4 A Rephrase it.

5 Q Sure, okay. At the time -- based on
6 your report, at the time that the explosion occurred
7 in the bag house, the flap of that damper was kept
8 propped open by an accumulation of dust, correct?

9 A That's the -- his observation, yeah,
10 and that was my -- that was my basis as well.

11 Q In that situation, okay, is it capable
12 of closing completely in order to prevent that blast
13 from going into the ducts?

14 A A backblast damper operates in two
15 ways. First, you actually size it or install it in
16 the ductwork based on what the chemical
17 characteristics of the dust is.

18 What you want to do is is when the
19 explosion would take place in the dust collector, it's
20 going to take a certain amount of time for the
21 pressure wave to radiate out from the -- from the dust
22 collector. The pressure wave's role is to take the
23 damper blade and slam it shut. If it's open, I mean,
24 if the system is running or anything else like that,

1 options that you have to pick from at that point.

2 Q With a backblast damper, is one of --
3 one of the functions that that performs is to prevent
4 the flow back from the dust collection system into the
5 building when the system is not operating?

6 A That's a -- that's a secondary use of
7 it. It just happens to work that way. But there are
8 backflow preventers that don't do that. That
9 particular design gives you that function if it's not
10 in operation -- if it's not in operation as an
11 explosion device. But if you are selling it as a --
12 if you buy a backflow preventer, you don't get a
13 backblast damper and the other way around.

14 Q Okay. In your -- in the designs of the
15 systems that you have done, have you used both a
16 backblast damper and a backflow damper?

17 A I have used backdraft dampers on
18 systems that are not combustible dust, and I have used
19 backblast dampers on systems that are combustible
20 dust, but not the -- not to the design that's there
21 would I use it for a backblast damper.

22 Q And in -- in this particular case,
23 okay, you have indicated that Mr. Hodges has said that
24 the flap for the damper was kept open by the

1 understand. You referred to two different
2 descriptions here, backflow damper and a backblast
3 damper. And you have mentioned NFPA --

4 A Yep.

5 Q -- as designating those two two
6 different things.

7 A To say that -- if you look, probably,
8 in the ASHRAE handbook, it probably talks about
9 backdraft dampers. It probably doesn't talk about
10 backblast dampers because they don't deal with
11 explosions.

12 But it is a industry-accepted term that
13 if you look at it and you are saying you are buying a
14 backdraft damper, the expectation is it's going to
15 stop the draft of air once the system is down. It's
16 not going to stop the explosion.

17 Q Is there any other term that is used
18 for an explosion isolation damper?

19 A Well, there is different -- there is
20 passive flame front arresters. There is different
21 NFPA names for it, but the function is still the same,
22 to stop that blast from going backwards. They are not
23 all designed like with a flap into it. It could be
24 change of direction. There is a lot of different

1 some shape or form.

2 Q Is that an industry definition, or
3 where does that come from?

4 A That's more of a -- from my experience
5 side of it, there is a industry definition on a
6 backblast damper or a backflow preventer. There are
7 requirements at NFPA 69 for what those need to be and
8 what pressures they need to withstand.

9 Q Well, again, in determining -- you are
10 putting forth that that's the purpose of a backblast
11 damper?

12 A Yes.

13 Q Is there a specific industry standard
14 or definition that you can refer to for that
15 description?

16 A If you look at NFPA, 69 is going to
17 talk about a backflow -- you know, backblast damper or
18 backblast preventer.

19 Q I'm sorry. NFPA distinguishes between
20 backblast damper and backflow damper?

21 A Well, in the backflow -- in NFPA, the
22 backflow damper really -- or backflow damper isn't
23 going to provide you the protection that you need.

24 Q And, again, I am just trying to

1 based on that you have denser colder air on the
2 outside of it, less dense air on the inside of it, and
3 it's going to find equilibrium. So there are two
4 different types of devices. One is a backflow
5 preventer. The one is a backblast preventer.

6 Q In 2002 was that a distinguishing
7 description of those parts?

8 A In my -- in my view and my expectations
9 as a designer, of an engineer of those systems, I
10 would know the differentiation between those two
11 systems.

12 Q Okay. So if someone orders a backblast
13 damper, okay, from a catalog --

14 A It better -- if they are advertising it
15 as a backblast damper, then it better meet the
16 requirements that are required to withstand a
17 explosion that's inside that dust collector. All the
18 components of the dust collection system need to be
19 capable of withstanding that explosive pressure.

20 Q In your report, there is a couple --
21 couple places where you define the purpose of a
22 backblast damper as a device to prevent an explosion
23 from propagating through dust; is that correct?

24 A That could -- I am sure it says that in

1 into the plant. Imagine that the fireball is like a
2 big balloon. Anyplace that you put a hole in that
3 balloon, you are going to get equal flow out of. It's
4 looking for the least -- it's looking for the easiest
5 way out. If you build a enclosure that can withstand
6 the explosive forces without any problem and don't do
7 it and don't put anything on the inlet, that fireball
8 and all those gasses is going back into your process
9 where it's going to pick up fresh fuel. You are going
10 to have secondary explosions and, in this case, a
11 tragic incident.

12 Q Now, in this particular case, one of
13 the parts that we are referring to is my clients'
14 backblast damper. Within the ventilation field, okay,
15 what does blast mean?

16 A Blast means that it's going to stop a
17 blast.

18 Q And does it distinguish between what
19 that is a blast, whether it's a blast of air or an
20 explosion? Is there a difference?

21 A A blast -- it could be the pressure
22 wave ahead of the blast. The difference is a backflow
23 preventer is something that closes when the fan shuts
24 off to prevent air from going back into the building

1 Q Okay. Well, would you agree that the
2 requirement to use the NFPA 69 standards is explicit
3 for powder plants, but not mentioned in the sections
4 regarding processing and finishing of aluminum?

5 A It's incorporated into all parts of
6 that chapter. Powder plants have specific things that
7 are in addition to the aluminum standard. Just
8 because you have aluminum -- just because you have a
9 combustible dust, it requires that you have explosion
10 protection for it. Whether it's spelled out and says
11 if the combustible dust looks like this and is painted
12 this color, you don't have to have explosion
13 protection, if it's combustible, you have to have
14 explosion protection.

15 Q And in the system at Federal-Mogul, the
16 bag house was part of that explosion --

17 A The bag house -- the bag house -- the
18 entire system is going to be explosion protection.
19 You would have to have explosion protection because
20 it's a combustible dust, which the explosion proved
21 that it was a combustible dust. That you would have
22 to have a explosion protection on the bag house. You
23 would have to have inlet isolation. The inlet
24 isolation keeps that fireball from going backwards

1 with aluminum. Some are specific to aluminum powder,
2 but the rest of the chapter is specific to aluminum
3 dust. The requirements and the safety requirements or
4 explosion protection requirements don't change just
5 because it's not aluminum powder.

6 Q In 2002-2003 when this system was being
7 installed, was an explosion isolation device required
8 by the codes or standards that were in place at that
9 time?

10 A Yes.

11 Q And, specifically, what code or
12 standard was applicable to this system?

13 A 484, 68, 69. And if you look in the
14 beginning of any of the NFPA codes, they incorporate
15 by reference every other standard that they write.

16 Q And is -- NFPA 69 in the code
17 applicable at that time, was that explicit as to 484
18 for powder plants?

19 A 69 -- NFPA 69 was for explosion
20 protection systems. NFPA 484 required that you
21 provide explosion protection for equipment that's
22 handling aluminum dust. Whether it's powder or if
23 it's machined aluminum, anything that's combustible
24 aluminum falls under that section.

1 explosive. It's awful hard to get ten of those up
2 into the air and get them to explode. You grind it
3 down into hundred micron parts or into a combustible
4 dust side of it, it's extremely combustible.

5 MR. MORRIS: Just so our record is
6 complete, if we can mark that as Schloss 2.

7

8 (Deposition Exhibit Schloss 2 was
9 marked and entered into the Record.)

10

11 THE WITNESS: Again, that's why the
12 chemical characteristics of the dust is
13 important to have in making that
14 determination.

15

16 BY MR. MORRIS:

17 Q And where I was going with that
18 question is that, in terms of the requirements, in
19 particular, for explosion isolations or explosion
20 containment equipment, NFPA distinguishes between an
21 aluminum powder plant and other plants that have
22 aluminum as a byproduct, correct?

23 A Yes. There is a section -- in 484
24 there is a chapter that handles aluminum, that deals

1 fine. I haven't -- I have an example on the end of my
2 finger of how powdery the -- small the dust was.
3 Again, this was on a different machine that's
4 representative of the type of dust that's onto it. Do
5 you want to add it as an exhibit? But that was -- the
6 dust that was being captured off of the steel brushers
7 was that.

8 MR. HARBERT: Can we show that to the
9 camera?

10 MR. HUDGINS: Somebody just voted in
11 Afghanistan.

12 THE WITNESS: That's it. They got a
13 purple thumb or whatever they got.

14

15 BY MR MORRIS:

16 Q And based on that observation, you
17 extrapolated from that that the dust created on the
18 aluminum line was similar?

19 A From that and looking at the dust that
20 was inside the piping. A lot of it was caked up due
21 to the moisture, but you could find fine particulate
22 down in there, down in the material that was inside
23 the ductwork as well. So -- but, again, aluminum
24 could be explosive. You know, that aluminum can isn't

1 times the diameter of a human hair, extremely small.
2 At one time NFPA stopped at that point saying it was
3 over 500 microns. Now they changed the definition so
4 that it says anything that's got a high surface area
5 versus mass. The hundred microns is -- below a
6 hundred microns is where they do the testing,
7 combustion testing, to get out the fine particles, and
8 it's tested at 75 microns and below. The dust
9 collector is a wonderful product classifier in that
10 the really fine dust ends up on the bags. It ends up
11 not falling down into the dust collector. If the
12 heavier particles that are greater than 100 microns or
13 150 or 200 microns probably fall into the -- well,
14 will fall into the hopper by themselves. The fine
15 dust has got to glomerate on the bags until it's large
16 enough and weighs enough that it will fall down
17 through the air stream.

18 So by knowing the chemical
19 characteristics and the particle distribution of the
20 dust that's there determines how combustible it is.

21 When we were doing the site visit, I
22 looked at the same piece of equipment, but handling
23 steel. And -- I may have taken a picture of that. I
24 am not sure if I did. But the -- the dust was very

1 an aluminum powder-producing plant?

2 A Aluminum powder is where they take
3 aluminum, melt it down, atomize it into a fine
4 particulate probably with the consistency of baby
5 powder, and it is extremely explosive and extremely
6 susceptible to exothermic reactions.

7 Q That's not what we had here, correct?

8 A No. But if you look at the type of
9 dust is aluminum powder is a separate issue and is
10 handled in NFPA 484 as a separate section of aluminum.
11 It has specific requirements just for aluminum powder
12 because it does have such a chance of having
13 exothermic reaction. But in the dust that was in the
14 dust collector, it's still aluminum. The thing that
15 makes a dust particle explosive or having a better
16 chance of being explosive is the size of the particle.
17 So what you want is a particle that has a low mass,
18 but yet high surface area. At one time NFPA said less
19 than 500 microns, human hairs, a hundred microns, so
20 you are talking about stuff that's pretty small.

21 Q The width of a dime?

22 A No, not close.

23 Q Less than that?

24 A No. Human hair is a hundred to five

1 melt to have certain characteristics.

2 Q Is there a -- is there a difference in
3 the ventilation system that you would have for an
4 aluminum powder plant versus a plant that has aluminum
5 dust as a byproduct of the manufacturing system?

6 A Do you know what a -- let me ask you
7 this: Do you know what an aluminum powder plant is or
8 the difference between aluminum powder and aluminum?

9 Q Aluminum powder, as I understand it, is
10 produced for use in explosives --

11 THE VIDEOGRAPHER: Off the Record,
12 please. We got a breakdown, got a technical
13 difficulty here.

14
15 (Discussion off the Record.)

16
17 MR. MORRIS: If the court reporter can
18 read back where we were.

19
20 (The court reporter read the requested
21 portion of the record.)

22
23 BY MR. MORRIS:

24 Q Mr. Schloss, can you tell us, what is

1 involved on the fourth time it burned down. I didn't
2 investigate the first three times. It was just after
3 the fourth one. And I know they had had it tested
4 each time between it. And, again, each one of those
5 was a fire that was in the bag house that originated
6 in the bag house by exothermic reactions.

7 Q Okay. And in that case were you able
8 to determine the length of time that the exothermic
9 reaction had been ongoing?

10 A No. No. And, again, by the time I was
11 involved into it, they had already switched out --
12 they actually had two bag houses, so they could switch
13 them out fast enough when they burn them down. So the
14 one that had actually burnt down was already being
15 repaired and refurbished and brought back to the site.

16 Q And then -- and that aluminum dust, was
17 that at a aluminum powder-producing plant or --

18 A No.

19 Q It was a byproduct of another --

20 A No. It was aluminum and the process
21 roll forms of steel sheath around metal dust,
22 aluminum. It could be aluminum, it could be steel, it
23 could be copper that's used in the steel industry to
24 fine-tune their electric arc furnaces to get the batch

1 A Yes.

2 Q How many times?

3 A Once in explosions and probably four or
4 five that had pulses that we talked about before where
5 they had minor explosions that didn't cause any
6 structural damage or use the -- and I have also
7 designed and been the design engineer on systems that
8 didn't explode for combust -- for metals in bag
9 houses.

10 Q Now, in your --

11 A So far I have got it right every time.

12 Q So, with respect to the one explosion
13 that you were part of that investigation, your role in
14 that is not as a explosion cause and origin expert, is
15 it?

16 A My expertise is in combustible dust
17 side of it, yes. If you want your house fire
18 investigated, no.

19 Q All right. With respect to that
20 explosion, were you able to test the dust that was
21 involved in that explosion?

22 A We had -- we had the dust tested prior
23 to it, and it was dust coming off of a process, so it
24 was repeatable. And after -- after the -- I got

1 that's actually doing the process.

2 Q Well, and I guess the question I go to
3 here is: With respect to facts that you are working
4 with, again, observation of Mr. Hodges and your
5 interpretation of the video, those are the two facts
6 you rely on?

7 A And experience.

8 Q I understand based on that, but if we
9 take those out, just as a hypothetical, if you do not
10 have the video, okay, and you don't have a direct
11 observation from Mr. Hodges, okay, based on your
12 experience, can you still come to the same conclusion?

13 A It would still -- exothermic reaction
14 would be something that I would investigate as part of
15 that and would be a cause of it the same way I did it
16 here where I determined it was two causes, or two
17 possible causes, one in the ductwork, one in the dust
18 collector, and use the eyewitness report and the video
19 to decide where the origin was.

20 Q Okay. Now, based -- you keep referring
21 to your experience, so I guess two questions come to
22 mind for me, is, one, have you investigated aluminum
23 dust ventilation systems for explosions in bag houses
24 before this one?

1 large amounts of dust.

2 Q Okay. So is it fair to say that the
3 principal basis for your opinion that it was an
4 exothermic reaction that ignited aluminum dust
5 particles in the bag house is, one, the witness
6 statement of Mr. Hodges that he saw the explosion
7 beyond the damper and, two, your interpretation of the
8 video?

9 A And my knowledge of dust collectors and
10 collecting dust -- collecting metal dust in dust
11 collectors.

12 Q I understand it's your training and
13 experience.

14 A That's my training and experience.

15 Q But in order to come to that
16 conclusion, you needed -- you need certain facts
17 before you?

18 A I need certain facts, and that's when
19 you asked before about the dust characteristics.
20 Would that have been helpful? That would have been
21 helpful. Again, what you are looking at is you could
22 have two processes similar in two different plants and
23 have two different dust characteristics based on the
24 type of machine or the manufacturer of the machine

1 them for 30 years, I do know how they work. I do know
2 how they clean.

3 And between those two things is is you
4 are always going to have dust in a dust collector
5 unless you go in and change the bags, wash it down,
6 you know, remove any waste barrels, anything that's
7 there. You are going to have dust that's capable of
8 being dislodged and coming down through the material.

9 Q Okay. And, again, having to go back to
10 the -- I am not sure. Maybe you told me, maybe you
11 didn't, but what's the temperature that you would have
12 to get from the exothermic reaction that would ignite
13 the dust?

14 A There is a minimum -- there is a
15 minimum ignition energy for aluminum dust that would
16 also be run at the same time when they are doing the
17 dust characteristics. It's called MI, and that's how
18 much energy would have to be available to ignite a
19 combustible dust cloud. If that information was
20 available from the dust that's there, I can calculate
21 and tell you how much it is.

22 Q We don't have that.

23 A You don't have that. So what you are
24 looking at is the ability for a dust collector to drop

1 in the air sufficient to fuel the explosion?

2 A Because they bought a dust collector
3 that for a aluminum dust -- for aluminum dust. So
4 inside the aluminum dust is going to be -- inside the
5 dust collector is going to be aluminum dust. Dust
6 collectors not only produce a combustible dust cloud
7 during a pulse. They can also do it from dust falling
8 off of the bags, dust coming -- falling off of the
9 side of the dust collector in a sheet coming down
10 through it. All it takes is the interaction between
11 the glowing embers or the glowing heat and the dust.
12 The whole dust collector doesn't need to be full. But
13 what happened in a case where the whole dust collector
14 wasn't full, you could end up with a smaller poof,
15 which then broke more of it loose, and you would
16 theoretically have a secondary explosion inside the
17 dust collector that tore it apart.

18 Q Okay. And, again, I am just trying to
19 find out how you came to the conclusion that there
20 was, one, a sufficient exothermic reaction that got to
21 a temperature that could ignite a sufficient --

22 A You have aluminum dust. You have
23 water. You are going to have exothermic reaction.
24 You have a dust collector. And after working with

1 the match far enough away from it that you are outside
2 that vapor level, it's not going to burn either. Now,
3 if you get it just right and you get it between the
4 lower flammable limit and the upper flammable limit,
5 then you have just made a mess and had a large
6 explosion and fire of gasoline.

7 So, in terms of vapors, you look at
8 those two things. You could have an environment
9 that's a hundred percent nitrogen -- or a hundred
10 percent hydrogen and you can't explode it.

11 Q Okay.

12 A You can have one that's 2 percent
13 nitrogen and not explode it. But in terms of metals
14 and metal dust or any type of dust, there is a minimum
15 explosive concentration, which means how much dust is
16 suspended in the air at that point. And it's usually
17 in grams per cubic meter.

18 But they don't give you an upper level
19 because it's -- it's not -- by the time you reach that
20 upper level, you are at dense phase material handling
21 where you are moving a slug through a pipe.

22 Q And in this case, though, what
23 assumptions did you have to make in order to come to
24 the conclusion that there was aluminum dust particles

1 hydrogen?

2 A I would think hydrogen probably
3 explodes at a lower level. But without looking it up,
4 I mean, that's just an assumption.

5 Q Okay. And do you have an opinion as to
6 whether or not there was hydrogen present in the bag
7 house at the time of this explosion?

8 A There would have been hydrogen present
9 if you had a exothermic reaction, but the hydrogen
10 present I didn't account for. I assumed it would be
11 less than the lower explosive limit of hydrogen, which
12 I think is around 4 percent.

13 Q Okay. And what -- what's the -- well,
14 what's the critical mass for aluminum dust? If you
15 say it's 4 percent for --

16 A Well, the minimum explosive
17 concentration --

18 Q All right.

19 A -- is a difference between when you are
20 talking about a gas and when you are talking about a
21 solid. If you take gasoline, you take a 1-gallon can
22 of gasoline, if you could get the match down into the
23 gasoline without going through the vapor barrier, it
24 wouldn't burn because there is no oxygen. If you get

1 a hydrogen explosion inside the dust collector. It
2 was -- I based my opinion that it was on the
3 exothermic reaction generating heat. The gas would
4 have been lighter than air and would have floated off
5 away from the surface, so it would have been diluted
6 into it and would have been at a level that you
7 wouldn't have had a hydrogen explosion in it. If you
8 seal up that dust collector and seal everything, you
9 can end up with that. I have been in a plant that had
10 aluminum -- 55 gallon of aluminum fine similar to
11 this; put it outside; the next morning they came in.,
12 The 55-gallon drum was round in that the top and the
13 bottom were bulged out. The seal was -- the clamp was
14 on so tight that it held the hydrogen inside -- inside
15 the dust collector -- or inside the 55-gallon drum at
16 the same time. But I didn't base any of these
17 assumptions on that the hydrogen exploded. If it did,
18 that would have just been something else, but --

19 Q Additional fuel along with the aluminum
20 dust?

21 A That would have been additional fuel
22 along with the aluminum dust.

23 Q Is the combustion temperature for
24 suspended aluminum dust different than that for

1 you can have the exothermic reaction. So there is a
2 heat generation of some type, and it also creates a
3 byproduct of hydrogen gas; is that correct?

4 A Yes.

5 Q And hydrogen gas is combustible?

6 A Very combustible.

7 Q Okay. And what temperature does
8 hydrogen gas combust at?

9 A I can look it up in the documents.

10 MR. HUDGINS: That's without an
11 external source of ignition?

12 THE WITNESS: That's without -- I can
13 go look. I can look it up in reference data,
14 but I don't have it available to me here.

15

16 BY MR. MORRIS:

17 Q Well, in reviewing this matter, did you
18 make a determination?

19 A No, but I didn't look at the hydrogen
20 gas as being part of that issue.

21 Q Would hydrogen be a fuel for an
22 explosion of this type?

23 A Hydrogen gas would be a fuel for that
24 explosion, but I didn't base my opinion on that it was

1 reaction would have to be ongoing for it to get to the
2 temperature that would ignite the fuel?

3 A Without knowing -- without the chemical
4 characteristics of the dust, no.

5 Q Okay.

6 A It would be a guess.

7 Q And fair to say that whatever that rate
8 may be, it would be affected by the temperature inside
9 the --

10 A Affected by the temperature and the
11 humidity inside the space. The reaction -- the water
12 vapor could have got out there two days before. It
13 could have got out there two minutes before, you know.
14 I don't --

15 Q So two minutes would be a sufficient
16 time --

17 A No.

18 Q -- for it to occur?

19 A Two minutes -- I don't know, because
20 without the chemical characteristics, you wouldn't be
21 able to calculate it.

22 Q Now, you are free always to correct me
23 when I am wrong. But I understand that when you have
24 this reaction between water and aluminum dust, that

1 delicate they can't run if its raining outside without
2 catching the bag house on fire, which they did four
3 times in less than a year and blew it up twice.

4 Q So, in this case, is it your conclusion
5 that the exothermic reaction is the source of ignition
6 based on the occurrence of the event itself?

7 A Rephrase it.

8 Q Well, the explosion occurred.

9 A (Witness nods.)

10 Q And you have indicated that essentially
11 you eliminated all possible sources of ignition first
12 down to the static electricity charge and an
13 exothermic reaction?

14 A Yes. And looking at it between whether
15 the explosion originated outside the plant or inside
16 the plant, by originating on the outside, it
17 disregarded the static that was generated inside the
18 plant and looked at on the outside of the plant what
19 was causing that.

20 Q Okay. So now having reached that -- or
21 either eliminating static electricity as the source of
22 ignition and now reaching the exothermic reaction as
23 the likely cause, is there any calculation that you
24 can make that would say how long the exothermic

1 A Again, we talked about that before.
2 That was provided that it was -- that the system and
3 the plant were operating up to between a half hour and
4 an hour and a half before the accident.

5 Q And when you say the system, you are
6 referring to the --

7 A Dust collection system and the wet dust
8 collectors.

9 Q Okay. So, now, with respect to the
10 condensation that you testified that would occur in
11 the bag house over -- basically, since it became
12 operational, is there -- what is the rate of reaction
13 for that condensation or the water and its interaction
14 with the aluminum dust that would lead to an
15 exothermic reaction?

16 A Well, for that specific dust, again,
17 without the dust characteristics, what was in there at
18 that time, it would be very difficult to determine
19 that. That's why if you had testing that showed what
20 the dust characteristics were, you could calculate
21 that.

22 I do work in a plant that handles --
23 that part of their manufacturing is aluminum as well
24 as steel, magnesium. And their systems are so

1 monitoring system or something that would go back that
2 far and monitor those conditions, no.

3 Q Okay. And as a result of not having
4 any physical evidence to determine that, is there any
5 assumption that you made with respect to the dew point
6 for the interior air of Federal-Mogul?

7 A My analysis was that it was going to be
8 higher than what the outside dew point was. 28
9 degrees is pretty low in terms of a dew point. Just
10 having people in occupied space with forklifts, people
11 moving around, it's going to be higher than that.
12 Typically, in a manufacturing plant that's not even
13 humidified, you are at 45 to 50 percent relative
14 humidity.

15 Q Do you know how many people were in the
16 plant that day?

17 A No.

18 Q Do you know how many -- what part of
19 their operations were ongoing on that day?

20 A I was told the plant was in operation
21 at that point. I would assume there was people in the
22 plant.

23 Q Okay. And where did you get that
24 information from?

1 Q I don't. I don't. Going back to your
2 testimony relating to the exothermic reaction as your
3 conclusion as the source of ignition in this case,
4 what was the dew point at -- for Blacksburg on
5 December 31, 2010?

6 A I have got the weather information for
7 that. Thursday, December 2010, what time? What time
8 of day would you like to pick?

9 Q I would assume at or about the time of
10 the explosion. So that's what, around 10 a.m.?

11 A At 10 a.m. the dew point was 28.4
12 degrees.

13 Q What was the outside temperature at
14 that time?

15 A 32.

16 Q How is that significant?

17 A It's cold outside.

18 Q Do you know what the -- what the dew
19 point was for the interior of the Federal-Mogul plant
20 on that date?

21 A No. That's not been provided.

22 Q And is there any way at this point in
23 time that that could be determined?

24 A Unless Federal-Mogul had a building

1 A He is a good engineer.

2 Q Are you familiar with his reputation in
3 the industry?

4 A He is, again, a good engineer.

5 Q And did you read the report from
6 Richard Roby?

7 A Yes. I reviewed it as well.

8 Q Do you know Richard Roby?

9 A No.

10 Q Are you aware that he is a member of
11 the committee for NFPA 921?

12 A No, but I also know other members of
13 the committee. That may not make them an expert in
14 anything more than being on the committee.

15 Q Absolutely. I just didn't know --

16 A I don't really think that buys you much
17 credentials on that.

18 Q So can you explain to me, what is
19 confirmational bias?

20 A I am not familiar with the term. I
21 know it's in 921 in the definitions. I know there is
22 a section on confirmational bias, but to sit here and
23 quote it -- if you want to get out 921, I can show you
24 where it is and tell you what it says.

1 overall argument what they were arguing, and I still
2 feel that my interpretation is accurate.

3 Q Okay. So maybe I can ask it this way:
4 Are the conclusions of the defense experts that you
5 have reviewed wrong or just a difference of opinion
6 based on different interpretations of the same data?

7 A Given those two choices, I would say
8 difference of opinion on what their data.

9 Q Okay.

10 A I think mine is right, and I don't
11 quite agree with theirs, but that's their prerogative
12 to come up with it.

13 Q Fair enough. And within your field,
14 that's not unusual that there are differences of
15 opinion?

16 A Differences of opinion that engineers
17 have from time to time.

18 Q I know you mentioned earlier that you
19 had worked with Doug Edwards previously at Kb/Tech.
20 And so, generally, are you familiar with the work that
21 he has done in the ventilation system industry?

22 A Yes. It's similar to what I do.

23 Q And do you have any opinion as to his
24 credentials within the industry?

1 A That didn't change my mind. Also, part
2 of the investigation I had was to be able to go up in
3 a scissors lift to that camera to get a better view of
4 what was there, looking at both out that door as well
5 as the ductwork and where the -- where the system was
6 installed.

7 So, using those two things, I still
8 think that my original -- or my conclusions are still
9 based on the original side of it where the initial
10 explosion took place outdoors.

11 Q And I understand your opinion. What I
12 am asking is: In having reviewed that and gone
13 through the methodology that was used by those
14 experts, was there anything in those opinions that you
15 read that you felt to be done contrary to scientific
16 methodology as -- before the NFPA 921?

17 A If there is a part of it that you want
18 to ask about, if there is a section, I will review
19 that section of the report. Again, I just looked at
20 the overall side of it, not each detailed...

21 Q So you can't speak to the details in
22 that report as to whether or not you evaluated each of
23 those details as it --

24 A I looked at in the overall -- in their

1 at what their major conclusions were. Maybe not all
2 of the science behind it, but what the major
3 conclusions were.

4 Q Okay. And specifically with respect to
5 the video evidence, did you read any of the
6 information that came to different conclusions as to
7 what the video evidence showed in this case?

8 A I read that. I still stand by my
9 conclusions of the video.

10 Q Did you discount it? Was it a
11 reasonable interpretation of the video, or was it
12 unreasonable?

13 A It was somebody's interpretation of the
14 video. It wasn't what I saw in the video.

15 Q Well, what I am asking is: Was --
16 based on your experience and in your opinion to a
17 reasonable degree of engineering probability, were --
18 was the opinions expressed with respect to the video
19 evidence in any way scientifically unreliable, in your
20 opinion?

21 A I looked at what their opinions of the
22 video were and their arguments on the video, and my
23 original opinions on the video still stand.

24 Q Fair to say that within your field --

1 explosion at its inception, was there any other
2 witness?

3 A That's the only one that I saw.

4 Q Since you have completed your report
5 and your conclusions, have you been provided with the
6 reports from the experts that have been retained by
7 the defendants in this case?

8 A Yes.

9 Q And have you had an opportunity to
10 review all of those reports?

11 A I did a quick review, not a detailed
12 review.

13 Q As part of the scientific methodology
14 as outlined in NFPA, when you are presented with
15 additional facts or other hypotheses, is there a
16 requirement to go back and reevaluate and retest your
17 own hypothesis?

18 A Yes. I look at what their opinions
19 were and go back and look at what my evaluation was,
20 what...

21 Q And based on your answer, you said, I
22 have looked at them briefly. Have you had the
23 opportunity to do that yet?

24 A Looked at them briefly, enough to look

1 investigation as to what the cause was for the damper
2 flap to be open such that Mr. Hodges could see past
3 it?

4 A Based on the testimony, there was three
5 to five inches of dust in the bottom of the ductwork.
6 My conclusion was that the dust was holding the damper
7 open. I do need to take a break, so --

8 Q Okay. Off the Record. Sure.

9 THE VIDEOGRAPHER: Off the Record.

10

11 (A recess was taken.)

12

13 BY MR. MORRIS:

14 Q Mr. Schloss, we are back after a short
15 break, and I guess we were finishing up -- we were
16 still talking about the witness statement of
17 Mr. Hodges.

18 So other than Mr. Hodges' statement
19 regarding his observation of the explosion, are there
20 any other witness statements that you reviewed
21 regarding the explosion?

22 A Other -- the ones I gave you as the
23 depositions, I reviewed all of those.

24 Q Well, specific to actually seeing the

1 damper, that you found to be contrary to the
2 information that you had from your investigation?

3 A Not that I recall at this point.

4 Q Okay. With respect to the backblast
5 damper and him being able to see beyond it, do you
6 know what the reason was that he was able to see
7 beyond the damper?

8 A The reason --

9 Q Well, withdrawn. Let me set that up
10 differently. You indicated that the -- the system was
11 not operating, correct?

12 A Uh-huh.

13 Q Okay. When the system is operating and
14 there is airflow going to the bag house, then the flap
15 of the damper would be pushed open, correct?

16 A Yes.

17 Q When that system is not operating, it
18 would be closed?

19 A It -- the design of it would be closed.
20 Whether it was closed -- there could have been buildup
21 of material, could have been just the damper was bound
22 against the side of it. Be hard to speculate on that.

23 Q Based on the information that -- well,
24 did you make a determination as part of your

1 BY MR. MORRIS:

2 Q All right. With respect to Mr. Hodges,
3 do you know whether or not he had any prior experience
4 in cleaning out ventilation systems?

5 A I have no work records on what he has
6 done other than in his statement he said, before when
7 they have had sparking, they have turned the RPM down
8 on the truck, so I assume that he did have experience
9 in that.

10 Q And --

11 MR. BROWN: Excuse me, you are losing
12 your microphone there. You may want to
13 adjust it.

14

15 BY MR. MORRIS:

16 Q And, again, did you interview
17 Mr. Hodges to find out --

18 A No. I -- I took his -- read his
19 deposition, but had no personal contact with
20 Mr. Hodges.

21 Q Okay. Was there anything else in his
22 deposition or -- withdrawn. Was there anything in his
23 deposition in terms of his testimony of his
24 observations, other than his description of the

1 A As an engineer that deals in this all
2 the time, I'd understand what I was looking at. As a
3 layman looking down a duct with a flashlight, I am not
4 a hundred percent sure I would know what a backdraft
5 damper or a backblast damper is going to look like.
6 I'd know what a fireball looks like, but anything that
7 was in the ductwork at that point I wouldn't --

8 Q Do you think --

9 MR. BROWN: Let him finish.

10

11 BY MR. MORRIS:

12 Q I am going to ask you going forward,
13 although some of my questions may seem open-ended
14 sometimes, they are asking for a very specific
15 response. And to the extent that I can, I want you to
16 -- or that you can, please confine the answer
17 specifically to the question, and we will move along a
18 little bit quicker.

19 A Okay.

20 MR. BROWN: You can answer -- let me
21 respond to that. You can fully answer any
22 question that he asks in the way that you
23 believe fully answers that question.

24

1 particular, eyewitness statements, correct?

2 A Yes.

3 Q Okay. And one of the ways that you do
4 that is to evaluate each of the statements that that
5 witness has made about the events, correct?

6 A Yes.

7 Q In this case Mr. Hodges' testimony that
8 he could see past the damper through the top, okay,
9 would you agree or disagree that that is incorrect
10 based on the configuration of the damper?

11 A His description does not match the
12 description of how the damper is actually built. What
13 he was describing there, I am not real sure of what
14 his interpretation of the top and looking over it. He
15 could have been looking at the buildup of aluminum
16 that was in the bottom of the ductwork. So it would
17 be hard to -- without getting a diagram or something
18 from Mr. Hodges, it would be hard to test that
19 statement.

20 Q And did you do that?

21 A No.

22 Q Okay. So --

23 A I mean --

24 Q Okay.

1 prejudiced.

2 MR. ALEXANDER: You are right. Thank
3 you.

4 MR. HUDGINS: Without belaboring the
5 whole thing, I think everybody on this side
6 of the table would disagree that his
7 questions are misleading in any respect. And
8 the witness who has indicated that he
9 reviewed the record is in a position to agree
10 or disagree with the foundation for his
11 opinion.

12 MR. BROWN: I hear you. I made my
13 objection. Unless you want to continue to
14 make the argument, then why don't we move on.

15 MR. HUDGINS: That's all.

16 THE VIDEOGRAPHER: Off the Record.

17

18 (Discussion off the Record.)

19

20 BY MR. MORRIS:

21 Q Mr. Schloss, thank you for your
22 patience. Again, now, referring back to Chapter 17 in
23 NFPA 921, one of the obligations that you have as an
24 investigator is to test witness statements and, in

1 know.

2 So that is what my -- that's what my
3 objection is, is that when you characterize
4 it, you are characterizing him saying that
5 this is the way it is. That is not an
6 accurate characterization. With that, then
7 you can go ahead and ask your questions. I
8 just didn't want to do that in front of the
9 witness.

10 MR. MORRIS: I appreciate that. Thank
11 you.

12 MR. HUDGINS: Assuming we were at trial
13 and you had just gone to the bench and made
14 that same objection, wouldn't the response of
15 the court be you're welcome to redirect your
16 witness and bring that out as part of your
17 case?

18 MR. BROWN: My duty in a deposition is
19 to, if I have a form of the question
20 objection, then I have to bring that up. And
21 I view this as being form of the question. I
22 think it's just misleading and incorrect. So
23 with that said, it's not being done in front
24 of the witness, so nobody is being

1 MR. BROWN: I want to make an objection
2 to your question, line of questioning, in
3 that it's mischaracterizing the deposition
4 testimony of Jeffrey Hodges, testimony as to
5 the condition of the -- or the location of
6 the hinge at the top. The question was on
7 Page 101: Was it a flap or a hinge at the
8 top? And the answer was: I don't know. I
9 know I could see that the flapper was in
10 there, and to me it looked like it pivoted
11 from the center, but I don't know. To
12 categorically say that he is testifying
13 affirmatively that, you know, absolutely this
14 is the way it is is a mischaracterization of
15 the evidence. The evidence is very clear
16 that what he was clear on because what he
17 says is in terms of the location of the -- of
18 the fire. It says on Page 75, But you are
19 clear in your mind that there was some fire
20 that came from behind the damper apparatus?
21 Answer: Yes, absolutely. So you have the
22 location of the fire coming from beyond there
23 absolutely. And in terms of the structure of
24 what he is seeing, he is saying he doesn't

1 Q Where it says witness observations, are
2 you familiar with that section?

3 A Yes.

4 Q Now, based on our discussion of
5 Mr. Hodges' testimony regarding his observations of
6 the backblast damper in addition to his observations
7 of the fireball, did you do anything to support or
8 refute his observations with respect to the condition
9 of the backblast damper?

10 A I don't understand the question.

11 Q Okay. Having read that and heard his
12 description that it was open at the top and it looked
13 like it was hinged in the center, okay, did you do any
14 follow-up in order to assess the -- to either support
15 that statement or refute that statement?

16 MR. BROWN: Before you answer that
17 question, I'd like to make an objection. It
18 may be a speaking objection. Let's go off
19 the Record. Could you leave the room for
20 just a moment?

21 THE VIDEOGRAPHER: Off the Record.

22

23 (Discussion off the Record.)

24

1 any other eyewitnesses to the events.

2 Q Okay. And did you ask whether or not
3 there were any other people present?

4 A I don't remember if I inquired on that
5 or not.

6 Q Have you read any of the depositions of
7 the LCM employees who are not plaintiffs in this case?

8 A No. Well, I did -- versus what's on
9 that list, there is other LCM employees. Danny
10 Collins -- ones I looked at were David Garard, Tommy
11 Lee Bonds, Jeff Hodges, John Paul Spangler, Danny
12 Collins, and Ed Thompson.

13 Q Okay. And was there any information
14 other than from Mr. Hodges that you had in terms of
15 specific facts and observations as to where the
16 explosion occurred?

17 A Not that I recollect.

18 Q Now, referring back to Schloss 1 again,
19 if we look to -- let me get to it -- 17.3.3.15, which
20 is on Page 162 at the top.

21 A 17?

22 Q .3.3.15. It will be at the bottom
23 right of Page 162.

24 A Okay.

1 A Yes.

2 Q Okay. And under 17.1.2 we have -- it's
3 that determination of the origin of the fire involves
4 the coordination of information derived from one or
5 more of the following: 1, witness information. The
6 analysis of observations reported by persons who
7 witnessed the fire or were aware of conditions present
8 at the time of the fire, correct?

9 A Yes.

10 Q And you previously told us that the
11 information that you have is from the depositions of
12 the plaintiffs, correct?

13 A And fact --

14 Q That's one, first?

15 A I mean, Federal-Mogul.

16 Q And the deposition of Federal-Mogul was
17 of David Garard, correct?

18 A Yes.

19 Q But Mr. Garard, you are not aware of
20 whether he was at the plant that day or not?

21 A No.

22 Q Okay.

23 A And I am not familiar with if anybody
24 from Federal-Mogul was at the plant or if there was

1 BY MR. MORRIS:

2 Q Mr. Schloss, we were referring to NFPA
3 921, and we have marked as Schloss 1 for
4 identification today a portion of 921 that starts with
5 Chapter 17, origin determination. Do you see that?

6 A Yes.

7 Q Okay. And would you agree that that's
8 a applicable standard for your investigation in this
9 case?

10 A Yes.

11 Q And do you accept NFPA 921 as
12 authoritative in terms of the investigation of fires
13 and explosions?

14 A Only in the combustible dust side of
15 it. I don't know anything about investigating a house
16 fire or a car fire or something along that.

17 Q Fair enough. As it relates to --

18 A As it relates to combustible --

19 Q -- your field --

20 A -- dust and what I do, yes, it does.

21 Q Okay. And within Chapter 17, origin
22 determination, there is sort of a recap of the
23 methodology and the scientific method for origin
24 determination, correct?

1 that it would be subject to criticism?

2 A Yes.

3 Q And within NFPA 921 in I believe it's
4 Chapter 17, there is a section that deals with witness
5 statements, correct?

6 A To know what chapter and what page and
7 what -- I am not familiar.

8 Q Let's see if we can get to it.

9 MR. MORRIS: Okay. Let's mark this as
10 Schloss 1.

11

12 (Deposition Exhibit Schloss 1 was
13 marked and entered into the Record.)

14

15 MR. BROWN: Do you have a copy for me?

16 MR. MORRIS: I don't.

17 MR. BROWN: Let's just take a moment,
18 and I'll make a copy. Does anybody else want
19 a copy of the exhibit?

20 THE VIDEOGRAPHER: Off the Record.

21

22 (A recess was taken.)

23

24

1 collector.

2 Q So the only relevant fact that you took
3 in order to rely on his testimony was the fact that he
4 said he could see past the damper. The details of
5 that description were not important to you?

6 A No, they were not important to me. I
7 mean, the bigger thing was is that he could see past
8 the damper and see the elbow, and that's where he saw
9 the fireball generate and come out.

10 Q Okay. I saw on your resume that you
11 are a member of NFPA.

12 A Yes.

13 Q And I understand that to be a member of
14 NFPA, all you have to do is pay the dues?

15 A That's right.

16 Q Okay. But you are familiar with NFPA
17 921?

18 A Yes.

19 Q And you use the scientific methodology
20 as directed by NFPA 921?

21 A Yes.

22 Q And if -- is it your opinion that if
23 the scientific methodology as set forth in NFPA 921 is
24 not used in a investigation of a fire or an explosion,

1 top or bottom?

2 A You couldn't tell where it was hinged.

3 Q Could you tell whether it was at the
4 top of the duct or at the bottom of the duct where it
5 was open?

6 A What he saw at that distance, I don't
7 know.

8 Q Okay. So --

9 A I just -- without reading and believing
10 what he described, I used more of the concept that he
11 could see past that and see the elbow.

12 Q Okay. Well, you said previously the
13 fact that you had his -- his testimony that he saw a
14 fireball from --

15 A Yes.

16 Q -- beyond the damper, that you accepted
17 that as true?

18 A Yes.

19 Q Okay. We have testimony from him
20 indicating that his observations of the damper, which
21 he had been able to see for a period of time prior to
22 the explosion occurring, was incorrect?

23 A It was incorrect, but he still said you
24 could see past it to see the elbow going to the dust

1 it would make that much of a difference on him looking
2 at it.

3 Q And do you recall him testifying as
4 follows: Question: Where you saw that you could see
5 a gap on the side, the top or the bottom.

6 MR. BROWN: What page are you on?

7

8 BY MR. MORRIS:

9 Q 101 Line 5. The total question is:
10 That's what I am trying to find out, where you saw
11 that you could see a gap on the side, the top or the
12 bottom. I apologize for the paraphrase. Answer: I
13 could see over the top of it from the center up. Do
14 you recall reading that in his deposition?

15 A Yes.

16 Q Okay.

17 A I don't remember what was just ahead of
18 that.

19 Q Is that an accurate description of the
20 configuration of the backblast damper?

21 A No, but looking down 40 feet of
22 ductwork with a flashlight, that may have been what
23 his interpretation of what he saw is.

24 Q That you couldn't tell whether it was

1 explosion.

2 Q Okay. Where is the hinge located for
3 the flap?

4 A At the top of the flap.

5 Q Do you recall reading in Mr. Hodges'
6 deposition when he was asked: Was the flap of the
7 hinge at the top? And he answered: I don't know. I
8 know that I could see the flapper that was in there,
9 and to me it looked like it pivoted from the center,
10 but I don't know. Do you recall reading that?

11 A Yes. Yes, I recall that.

12 Q Is that an accurate description of the
13 damper?

14 A From the -- the flap would have been
15 hinged at the top. He may have been looking at the --
16 I am not sure what his interpretation of the damper
17 and the hinge was. I used more that he could see past
18 that to see the elbow.

19 Q Do you recall that he testified that he
20 thought it was a center hinge and that it moved both
21 up and down? Do you recall that testimony?

22 A Yes.

23 Q Okay.

24 A I don't see where that -- the design of

1 BY MR. MORRIS:

2 Q For the purposes of my question, okay,
3 can you refer to Page 101?

4 MR. BROWN: He would have to have the
5 deposition. I don't think he has the
6 deposition in there.

7 THE WITNESS: I don't think I do.

8 MR. BROWN: I think he quotes the
9 deposition in his report.

10 THE WITNESS: But I don't think I
11 pulled that out separately.

12

13 BY MR. MORRIS:

14 Q Mr. Schloss, let me ask you another --

15 A Uh-huh.

16 Q Okay. Can you describe for me the
17 construction of the backblast damper?

18 A It's a rectangular box with -- in just
19 general terms, rectangular box with round collars on
20 either end to fit the ductwork, a incline blade that
21 seals against a -- one of those collars to stop the
22 transmission of energy back through the ductwork.
23 It's made to be open while the equipment is running
24 and the air is flowing across it and closed during an

1 did that give you any information?

2 A That the fireball had originated in the
3 bag house.

4 Q In terms of his description --
5 withdrawn. Do you recall what his description of the
6 damper was at his deposition?

7 A No, but I can look at it.

8 THE WITNESS: Do you have a copy of his
9 deposition, for Hodges? I may have a copy,
10 just that page.

11 MR. BROWN: No, not without my notes on
12 it, but we can -- we can take a quick break
13 and get a copy of these pages if you like.
14 Want to do that?

15 MR. HUDGINS: What were you looking
16 for?

17 MR. MORRIS: Let me see if I want --

18 MR. ALEXANDER: Does he want it?

19

20 BY MR. MORRIS:

21 Q If you have his deposition, if you
22 looked at Page 101 --

23 MR. BROWN: It's on a number of pages.

24 It starts well before that.

1 Q Okay. And what did you do to test that
2 account from Mr. Hodges?

3 A The other thing I used in doing that
4 was the video and looked at the flashes and where
5 those flashes originated. And so by using that with
6 his reaction, I determined that the explosion had
7 taken place in the duct -- in the bag house, not in
8 the ductwork, the initial explosion.

9 Q Did you consider Mr. Hodges' statement
10 to be reliable?

11 A Yes.

12 Q Okay. And what was that based on?

13 A Based on that he was there and seeing
14 it. I have talked to other people that have been
15 involved in them, in explosions and in flash fires,
16 and found them to be very reliable in what they
17 remember. It may be something as easy as they saw,
18 you know, bright orange flash coming out of a
19 55-gallon drum and landing 30 feet or 40 feet away
20 from the -- but they remember where the origin and
21 what they saw.

22 Q Okay. And when Mr. Hodges stated that
23 he could see that the fireball originated beyond the
24 damper, or the flue or whatever he called it, okay,

1 the area where the plaintiffs were working.

2 A That could have been just by the
3 vacuum. It could have been by the flow.

4 Q Okay.

5 A I guess any material flowing through a
6 pipe like that is going to cause a static buildup.
7 Just different materials dissipate it differently.

8 Q But you indicated previously that
9 that -- that the creation of the static electricity
10 and generation of sparks was a potential source of
11 ignition for combustion and explosion in this case?

12 A In -- it's a source of sparks and
13 having air going through a PVC pipe, yes, anything
14 that's ungrounded. Even ungrounded or unbonded steel,
15 you can still have the same issues.

16 Q Okay. Now, with respect to the
17 explosion itself, in your report you indicate that the
18 number one fact that you relied upon here was the
19 testimony of Mr. Hodges that he saw an explosion in
20 the bag house; is that correct?

21 A He saw a fireball coming down the
22 ductwork. He said he could see past the backdraft --
23 or backblast damper into the elbow, and he saw the
24 fireball originate from that point.

1 A No.

2 Q Are you aware whether or not flexible
3 hose is manufactured so that it does have grounding
4 material in it?

5 A Yes, it does.

6 Q In this case there is nothing to
7 suggest that this flexible hose had any grounding
8 material in it, correct?

9 A I have no information on that.

10 Q And then we get to the PVC pipe, or the
11 lance as you referred to it. And was the use of PV --
12 is the use of PVC pipe in cleaning aluminum dust
13 ventilation systems appropriate?

14 A It's nonconductive. So in anything
15 that's combustible dust, you need to use conductive
16 materials. PVC is not conductive, and I don't know of
17 anything that's commercially available like that that
18 is conductive.

19 Q Is it nonsparking?

20 A It will -- it will not transfer a
21 spark. A spark will build up on the surface of the
22 PVC, but it's not going to release a spark.

23 Q And, in fact, in this case the
24 information we have is that it did generate sparks in

1 be conductive nonsparking material? Is that --

2 A Yes.

3 Q -- part of NFPA requirements? In this
4 case, we had the vacuum truck, which we have already
5 discussed. And then from that there was aluminum pipe
6 that was attached to the vacuum truck, correct?

7 A Yeah, per my understanding and the
8 pictures.

9 Q Would that aluminum pipe fit those
10 requirements?

11 A Yes.

12 Q Okay. The flexible hose that was used
13 here?

14 A There are flexible hoses that are
15 conductive. I don't remember exactly whether the hose
16 that was used at this point was conductive material or
17 nonconductive construction.

18 Q You had an opportunity to see --

19 A I saw it.

20 Q -- that hose?

21 A I took a picture of it and was more --
22 looked at the lance and the PVC there.

23 Q The flexible hose that was used, do you
24 know whether or not that was grounded in any way?

1 reporter, please wait until I finish my question
2 completely before you start your answer. I will do my
3 best to extend you the same courtesy and allow you to
4 finish your answer completely before I move on. If at
5 any time you feel that you have not finished your
6 answer, please let me know, and we will make sure that
7 we get a complete record and one that we will all be
8 able to read for the benefit of our reporter, okay?

9 A Thank you.

10 Q We were discussing the vacuum truck
11 previously and the equipment that was being used by
12 the plaintiffs in their cleaning operation. You
13 mentioned a few things, so I just want to go through
14 the equipment that was being used in terms of the
15 bonding and grounding of the equipment.

16 With respect to the cleaning of ducts
17 involving aluminum dust ventilation system, would you
18 agree that you should use grounded and nonconductive
19 equipment?

20 A Yes. NFPA requires that all of the
21 ductwork, both in that type of system, a vacuum
22 system, a dust collection system, be grounded and
23 bonded.

24 Q And that whatever is being used should

1 going across that in that vacuum truck, going in the
2 ductwork, not in the vacuum truck.

3 Q Okay. And we do know that there was a
4 fire or some type of explosion within the vacuum truck
5 itself, correct?

6 A Which -- yes.

7 Q And that's not revealed on the video as
8 to when that occurred?

9 A No.

10 Q And we have no eyewitness information
11 as to when that occurred in relation to any other --

12 A Not that I am --

13 Q -- event of the explosion?

14 A -- familiar with.

15 MR. MORRIS: I apologize. Can we take
16 a quick break?

17 MR. BROWN: Sure.

18 THE VIDEOGRAPHER: Off the Record.

19

20 (A recess was taken.)

21

22 BY MR. MORRIS:

23 Q Mr. Schloss, continuing on -- first,
24 before we go further, at the request of our court

1 you -- are you aware of that?

2 A No. It may have been in deposition,
3 but I don't recollect it.

4 Q Next question: So the only operating
5 machinery that we have in this closed system is the
6 vacuum truck, correct?

7 A Yes.

8 Q Okay. And in your analysis, you -- you
9 didn't ask for any information or did not find any
10 information as to any safety procedures in terms of
11 grounding the truck and/or the system that were taken
12 with respect to the vacuum truck, correct?

13 A No. The vacuum truck -- the vacuum
14 truck itself is intrinsically safe. The ductwork and
15 everything that's hooked up to it would be hard --
16 would be hard to ground in that you have hose, you
17 have PVC hose, and PVC pipe that you are using as a
18 wand. So you would not have a continuous bonded path
19 from the time you are collecting it until the time you
20 are getting to the vacuum truck.

21 Q Does that create --

22 A It creates --

23 Q -- any additional risk of --

24 A It can create a potential of a spark

1 THE WITNESS: The system grounded or
2 the vacuum truck grounded?

3

4 BY MR. MORRIS:

5 Q Well, two things that -- we will go
6 through that. First of all, there has been testimony
7 that there was no grounding of the truck itself, okay?
8 What grounding of the system are you referring to?

9 A The grounding of the piping and
10 everything off of the vacuum truck, from the vacuum
11 truck out.

12 Q And in your investigation, is there any
13 information that you have that any of the equipment
14 that was connected to the vacuum truck was grounded?

15 A No.

16 Q Okay. So we haven't -- so the truck
17 isn't grounded and the system isn't grounded; is that
18 correct?

19 A Well, if the -- I don't understand the
20 truck not being grounded.

21 Q There has been testimony that there is
22 a specific method that they use in order to ground the
23 truck, that they can take a ground wire and attach it
24 somewhere. That was not done in this case. Were

1 points between the air that's being brought into it
2 and the air outside?

3 A No, because the friction that you are
4 going to -- the friction of sucking through all those
5 devices is going to heat that air up quite a bit. You
6 are going to end up with about a 2 degree rise for
7 every horsepower that those vacuums pull.

8 And the vacuum truck itself are
9 intrinsically safe, which means they are grounded,
10 bonded, everything. It by itself is a safe operating
11 -- if that wasn't true, you would be blowing up a lot
12 of vacuum trucks.

13 Q All right. And did you read in the
14 deposition transcripts in this case that the vacuum
15 truck was not grounded at the time of its operation at
16 Federal-Mogul?

17 A I did not read that.

18 Q Okay. And so --

19 A But, again, being grounded as the --

20 Q Mr. Schloss, I am going to --

21 A -- truck or the system being grounded?

22 MR. BROWN: He can answer the question.

23 MR. MORRIS: He did answer the

24 question. He went beyond my question.

1 A The vacuum truck, in my professional
2 experience, is a very safe device by itself. It's
3 only when you start hooking things up to it. So the
4 vacuum truck actually creating and originating the
5 explosion in the vacuum truck I ruled out.

6 Q Okay. Well, my first question was:
7 Did you consider it as a potential source of ignition
8 for the explosion that occurred in this case?

9 A Yes.

10 Q Okay. And the vacuum truck,
11 essentially, is similar to a bag house in that you are
12 pulling the dust and debris into a collection system,
13 correct?

14 A Yes.

15 Q And as part of this operation, we have
16 a closed system between the bag house, the ductwork,
17 the --

18 A Yes.

19 Q -- PVC pipe, the flexible hose, the
20 aluminum pipe, into the vacuum truck, correct?

21 A Yes.

22 Q The vacuum truck is outside similar to
23 the bag house. Would that be subject to the same
24 situation in terms of the difference between dew

1 factor? Was that the factor that -- of an
2 explosion? I don't see it.

3

4 BY MR. MORRIS:

5 Q Is it fair to say that in evaluating
6 all the potential causes of the explosion here that
7 eventually you came down to two possible causes, one
8 being the generation of the static electricity by the
9 use of the PVC pipe by the plaintiffs, or, as you
10 mentioned earlier, an exothermic reaction in the bag
11 house?

12 A Yes.

13 Q And you were able to eliminate every
14 other cause at that point?

15 A I'd have to go back through that list
16 of what I gave you, but, I mean, that was really --
17 really, at that point it came down to the video and my
18 opinion or my interpretation of the video of which
19 flashes were the bag house exploding and what flash
20 was the stuff coming back down the ductwork.

21 Q Now, did you consider -- just consider
22 as part of your evaluation here whether or not the
23 vacuum truck could have been a potential source of
24 ignition for this explosion?

1 A No. I looked at -- you know, looked at
2 the devices, you know, looked at a piece of PVC pipe
3 and the hose and the duct and how they had it all
4 hooked together and, you know, you can generate a
5 spark --

6 Q Okay.

7 A -- with the --

8 MR. BROWN: Excuse me. Let him finish
9 his answers. Please don't talk over him.

10 THE WITNESS: You can generate a spark
11 in it. Whether every other condition was
12 there at the time of the spark is really --
13 you know, again you are vacuuming something
14 in, so you are not generating a dust cloud.
15 You are sucking the dust cloud into it. You
16 are vacuuming, you know, the -- you are
17 vacuuming, you know, where the PVC will flow
18 through any type of -- any type or any type
19 of material is going to cause a static
20 buildup. PVC is not recommended to use for
21 that. You know, yes, there was things that
22 were not safe that were going to generate
23 sparks or less safe than they could have
24 been, but was that, you know, a contributing

1 your --

2 A Yeah.

3 Q -- prior investigations and otherwise,
4 that had they been following proper safety procedures,
5 you could have eliminated that as a cause; is that --
6 is that fair?

7 A You can never eliminate a hundred
8 percent of the risk of doing something like that even
9 safely, you know, following every safety procedure.

10 I have a chemical plant that I do work
11 in that had six people clean out a dust collector, a
12 welder strike an arc, and get burned across the faces.
13 You know, they met every one of their safety
14 requirements. They had everything -- he had the
15 proper PPE on. Luckily, it didn't burn his eyes, but
16 burned the hair off of his face.

17 Q And in this case, did you evaluate all
18 of those things as well?

19 A I was told about it. I didn't evaluate
20 that. It was for a customer that I was doing some
21 work with and an --

22 Q No, no, in this case.

23 A -- incident they talked about.

24 Q I understand.

1 A -- cause that has to be considered in
2 my evaluation.

3 Q And as part of that analysis, you have
4 to look at what equipment is being used?

5 A Yes.

6 Q And what potential there is for that
7 creating a -- an environment in which there could be
8 an explosion, correct?

9 A Yes.

10 Q And in this instance, in looking at
11 that and determining whether or not the equipment that
12 was being used for the cleaning of the aluminum duct,
13 did you reach any opinions as to whether or not that
14 was a potential cause?

15 A It was potential cause of -- what they
16 were doing could cause an explosion, yes. In terms of
17 if you isolate just that one part of it, yes, that
18 would --

19 Q But that's part of your analysis?

20 A Yeah. If you isolate and say they were
21 taking a piece of PVC and putting it -- hooked to a
22 vacuum truck, putting it into aluminum, there is a
23 cause there that you are going to generate sparks.

24 Q And based on your experience and

1 was. And you would agree with me, as we said before,
2 that you have to go through all possible causes and
3 eliminate them through scientific --

4 A Yeah.

5 Q -- methodology pursuant to NFPA 921,
6 correct?

7 A Yes.

8 Q Okay. One of those causes could be the
9 actions of the workers in this case. Could be,
10 correct?

11 A It was generating sparks and --

12 Q Okay. Just -- will you agree with
13 me --

14 A If you want me to stop right there,
15 that that's as far as you want me to go --

16 Q I want you to answer my question right
17 now.

18 A Okay.

19 Q My question is: The actions of the
20 plaintiffs, of the LCM employees, that is a potential
21 cause that has to be considered in your evaluation
22 of --

23 A That is potential --

24 Q -- this explosion?

1 potential causes for the explosion.

2 Q And can the failure to follow proper
3 safety procedures be a contributing cause to an
4 explosion?

5 A How about rephrase the question?

6 Q Sure. Do you need to eliminate the
7 improper use of equipment or a failure to follow
8 necessary safety procedures as a cause of an
9 explosion?

10 A I look at what they were doing as a
11 cause of an explosion. How they picked them and the
12 decision that they made to pick those types of devices
13 doesn't really matter. It's -- it's what was
14 physically being done at the time of the explosion.

15 Q Okay. And in this particular instance,
16 did you reach any opinion as to whether or not the
17 actions of the plaintiffs could have caused or
18 contributed to the explosion that occurred?

19 A I don't -- in my professional opinion,
20 it didn't contribute to the explosion in the dust
21 collector.

22 Q Not my question.

23 A Okay.

24 Q I understand what your final opinion

1 Q Well, in evaluating the potential
2 causes of an explosion, would one of the factors be
3 what the individuals were doing and whether or not
4 they were taking appropriate safety procedures before
5 you reach your final opinion?

6 A Before -- I looked at what they were
7 doing, not what they were trained to do. I looked
8 at --

9 Q Okay. Well --

10 A -- devices they were using on the
11 cleaning when we did the field -- looked at it in the
12 field and looked at the devices they used and the hose
13 and tubing and things like that. I looked at those.
14 I did not look at whether they were trained in -- they
15 may have been trained, and that's the decision they
16 made to use those equipment. It doesn't necessarily
17 mean training equals results.

18 Q And for the purpose of this question, I
19 am not asking about their training. I am asking about
20 actually what they were doing and whether or not they
21 followed proper safety procedures, if that's a factor
22 that you would consider in evaluating the potential
23 causes for this explosion.

24 A I evaluated what they were doing as

1 Q I understand. But based on your
2 experience where you have evaluated explosions and you
3 have trained people on how to work around these types
4 of systems --

5 A If I was contracted with LCM, I
6 would -- I would have evaluated their systems. And if
7 they were deficient, I would have made the
8 recommendations to do the training.

9 Q Did you read in the deposition
10 transcripts that the supervisor of the job was aware
11 that aluminum dust was the product in the system they
12 were cleaning? Do you recall that?

13 A Yes, that it was -- aluminum dust was
14 the product. Whether he realized that aluminum dust
15 was combustible, I didn't see that.

16 Q Okay. And if he testified that he was
17 not aware that aluminum dust was combustible, do you
18 have an opinion as to whether or not that is a safe
19 procedure for LCM to proceed in cleaning the ducts at
20 Federal-Mogul?

21 A Well, really, I am not here to evaluate
22 what LCM did, you know, and -- you know, and whether
23 they trained their people onto it. I can only look at
24 the results of what that was.

1 very strong about teaching of -- training of your
2 employees.

3 Q And have you evaluated Federal-Mogul's
4 training procedures for its employees relating to the
5 aluminum dust ventilation system?

6 A I have seen in Federal-Mogul's
7 combustible dust management guidance and the
8 management program where they talk about that. I have
9 looked at what -- what's available at that point, but
10 no farther than that.

11 Q Okay. And what about LCM? Did you
12 evaluate their --

13 A No.

14 Q -- procedures with respect to working
15 on an aluminum dust ventilation system?

16 A No.

17 Q And why not?

18 A My understanding from reading the
19 depositions, I guess, was is that they were not
20 advised of the risk of aluminum combustible dust. The
21 actual workers that were on the platforms were not
22 advised of combustible dust. Again, whether LCM is,
23 you know, negligent at that point or liable for that
24 point, I am not here to talk about that.

1 A More likely than not.

2 Q -- the function of the system, it was
3 able to handle those small explosions if it did occur?

4 A But you don't design for small
5 explosions.

6 Q That's not my question at this point.
7 I understand --

8 A That's my answer. That's my answer at
9 this point is is you can have explosions in anything
10 that's not going to result in the damage or even
11 triggering any, you know, explosion protection device.
12 It depends on what the dust is at that moment, what
13 the ignition source is at that moment, how much
14 dispersion you have at that moment, how much volume of
15 material you have. All those things together are
16 going to determine how strong of an explosion do you
17 get.

18 Q And would you agree with me that when
19 you are working with an aluminum dust ventilation
20 system, that whoever is working on that should be
21 aware of the risk of explosion in a system of that
22 type?

23 A Federal-Mogul is required to teach
24 their people the risks around that. I mean, NFPA is

1 going to burn anything. You can get exothermic
2 reaction of a bigger pile of dust, and it may catch it
3 on fire.

4 Q I understand that. I understand that,
5 but what -- if I understand what you have told me is
6 that there could have been prior exothermic
7 reactions --

8 A There could have.

9 Q -- in the bag house that resulted in
10 smoldering and then, for whatever reason, fizzled out
11 or stopped.

12 A Yes.

13 Q Because if it continued, we would have
14 seen something else occur. There could have been
15 exothermic reactions that led to a small explosion
16 that went undetected because no one was in the area to
17 see it, hear it, or --

18 A And not be --

19 Q -- know it happened?

20 A And not be strong enough to activate
21 the explosion vents.

22 Q Right, okay. So all I am saying is
23 that if that occurred, and you say that's a
24 possibility that it did occur, that in terms of --

1 BY MR. MORRIS:

2 Q I will adopt probability.

3 A I have been in a plant that did shot
4 blasting, and I asked and said, Have you ever had an
5 explosion? They said, No, but every now and then our
6 dust collector goes plump and the sides pulse out.
7 You know, have they been having explosions? Yes.
8 They just didn't have one at a high enough degree that
9 was going to cause the thing to rip apart or, you
10 know, the vents to actuate. You could have had
11 exothermic reactions for all those seven years that
12 would have went undetected and not cause an explosion.
13 It could have been the first time in seven years there
14 was an exothermic reaction.

15 Q So based on that then, in terms of the
16 explosion containment of that, if that did occur, then
17 the system operated properly on those prior occasions,
18 correct?

19 A No. I mean, no, because it may not
20 have met -- it may not have resulted in an explosion.
21 It may not have resulted in a fire.

22 Q Well --

23 A You can have exothermic reaction of a
24 small pile of dust that's sitting there, and it's not

1 things line up that's going to happen. A lot
2 of bag houses explode for no apparent reason.
3 Why did they explode that day versus 40 years
4 prior to it? You know, a lot of times there
5 is no real definite answer and say, well, it
6 blew up this day because of this and it blew
7 up this day -- you know, why didn't it do for
8 the last 40 years? So it -- all those things
9 have got to come together at one time.

10
11 BY MR. MORRIS:

12 Q And I understand that. That's why I am
13 asking you -- you can't say to a reasonable degree of
14 engineering certainty as to why it did not occur on
15 any other prior day, even though the same conditions
16 may have been present?

17 A It may have --

18 MR. BROWN: Before you answer, form of
19 the question objection. You asked about
20 engineering certainty, and that's certainly
21 not what the standard is. It's probability.

22 MR. ALEXANDER: Reasonable degree of
23 engineering probability.

1 opinion that the conditions for an exothermic reaction
2 and the other -- as an ignition source and the other
3 elements that would lead to an explosion were present
4 in that bag house?

5 A Yes.

6 Q All right. And as you sit here today,
7 you cannot give an opinion with a reasonable degree of
8 engineering certainty as to why an explosion would not
9 have occurred on any day prior to this?

10 A Well, it really depends on if the
11 equipment -- if the dust collector itself is running,
12 is operating. You are moving warm air across the
13 steel, so you have less condensation. If it's
14 running, you know, it's -- an explosion is a perfect
15 storm. All those things have got to come together.

16 Q Well, let me --

17 MR. BROWN: Excuse me, he is not
18 finished answering yet.

19 MR. MORRIS: I think he is going beyond
20 the question. That's why -- so --

21 MR. BROWN: He is entitled to finish
22 his answer.

23 THE WITNESS: I think an explosion is a
24 perfect storm. You have to have all these

1 exothermic reaction then isn't dependent on additional
2 water. Once it starts that reaction, it's going to
3 keep heating itself. It's all self-contained.

4 Q Okay. Well, then, based on what you
5 have told us so far, when this ventilation system
6 started operating back in 2003 or so and you had those
7 conditions, are you saying that an exothermic reaction
8 very likely would have started back in 2003?

9 A If you have the same situation that you
10 have there that day, that's very possible or, in my
11 opinion, would happen.

12 Q Okay. Well --

13 A In my opinion, you would have that
14 same -- whether it would have resulted into a fire or
15 an explosion really would have been dependent on the
16 material in the bag house.

17 Q I think that's obviously where we are
18 going to get to next is -- and, again, the ignition
19 source we come to is why on this day was there a
20 confluence of factors that occurred here. And I am
21 not asking the question yet, but that's obviously
22 where I am going.

23 Previously, based on your testimony and
24 based on the conditions that were there, is it your

1 set it down, pretty soon the water starts condensing
2 on the outside of it and going -- running down the
3 sides of your Coke can. Okay.

4 Take the same Coke can when it's 20
5 degrees outside, and the water does not form because
6 the temperature of the Coke is higher than the dew
7 point temperature of the air around it.

8 Reversing that and putting the moisture
9 on the inside of the bag house in a cold skin
10 temperature with steel that has very rapid temperature
11 exchanges, you are going to have a -- the bag house is
12 going to cool very quickly down to that outside
13 temperature and then the dew point, and you are going
14 to start having sweating on the inside of that bag
15 house. It can sweat on the bags. It can sweat on the
16 sides, in the hoppers.

17 Q If -- if the bag house is shut down for
18 an extended period of time, for more than the up to
19 hour and a half that we have here, let's say 24 hours,
20 48 hours or longer, does that affect the -- that
21 situation with the condensation?

22 A Once the condensation is into the
23 material, in the case with metal, as in aluminum, you
24 are going to start exothermic reactions. That

1 A Depending on the -- one, if the bag
2 house is operating, and two is is what the outside
3 conditions are. If the bag house is not operating
4 or -- or if it's cold outside, depending on what the
5 outside temperature and the dew points are, you will
6 start to condense on the inside of the bag house.

7 A lot of processes that are in
8 metal-producing plants, you insulate the bag house to
9 keep that transfer from happening so that you don't
10 end up with the skin temperature dropping below the
11 dew point temperature and condensing water into it.

12 Q Okay. And what if -- okay. Is there
13 any similar type of situation that would occur when
14 the temperature outside is hotter than it is inside?

15 A No.

16 Q Okay. So the difference in dew
17 point -- you could have a difference in dew point --

18 A Two things. One is the outside
19 temperature, which is going to determine what the
20 temperature of the steel in the bag house is and what
21 your inside humidity is on the -- on the bag house.

22 To use an example, if you have a Coke
23 can in the middle of the summertime, and the Coke is
24 40 degrees inside the can, you walk outside and you

1 have any effect on the amount of -- or will that have
2 any effect on the dew point for the interior of the
3 Federal-Mogul plant?

4 A Over time it would. In that amount of
5 time, I don't think you would see -- my personal or my
6 professional opinion is you wouldn't see much of a
7 change in it. Again, too, by having that
8 water-producing equipment, it was producing water
9 while it was running as well. So the dust collector
10 would have been seeing that moisture over an extended
11 period of time.

12 Q So, again, that -- whenever it was
13 operating over the seven years before, you are
14 indicating that there would have been moisture in the
15 air that was being transported into the bag house?

16 A Yes.

17 Q Is that correct? Okay. And that the
18 moisture that's being transported, if it's shut down
19 for a short period of time, such as a half an hour to
20 an hour and a half, would have no effect on the
21 moisture being transferred to the bag house? That's a
22 bad question. Let me withdraw that. Let me ask
23 another question. The -- the water vapor that gets to
24 the bag house, what happens to it when it's in there?

1 Q -- just the production line that was
2 for the aluminum dust, that created the aluminum dust?

3 A My understanding was -- again, I didn't
4 check to see if the rest of the plant was running. My
5 interest was in the lines that were served by that
6 dust collector. And if you were running the process
7 -- if you were running the dry dust collectors, you
8 would have to be running the wet dust collectors to
9 handle another part of this same production line. So
10 my assumption was is that since both of them were
11 running at that -- required to run, that it would be a
12 requirement that both the dust collector and the wet
13 dust collector would be running. And, again, that's
14 based on how the system is currently designed or --
15 and what was specified in Federal-Mogul's design
16 documents.

17 Q Okay. And based on your prior answer,
18 it's your understanding that that particular line, the
19 aluminum dust ventilation system, including the water
20 vapor-producing equipment, had been shut down between
21 a half hour and an hour and a half before LCM started
22 its work?

23 A Yes.

24 Q The fact that it's shut down, does that

1 Q Okay. Have you done any testing or
2 created any models to determine the extent to which
3 that particular equipment in the Federal-Mogul plant
4 would raise the dew point or increase the relative
5 humidity for the plant air?

6 A No, but I know how to do it. I do it
7 as part of my business. I just did not do it in this
8 case.

9 Q So, as you sit here today, can you
10 provide any basis for -- withdrawn. Can you tell us
11 what the dew point was for the Federal-Mogul plant
12 inside the plant on December 31 of 2010?

13 A No.

14 Q Do you know whether or not the water
15 vapor-producing equipment was operating at
16 Federal-Mogul on that day?

17 A I have been told that it was.

18 Q Okay. Told by who?

19 A Again, when I asked the question was
20 the plant operating, they said up to the time when it
21 was shut down to start cleaning the ductwork.

22 Q And when you say the plant being shut
23 down, is that the entire plant or --

24 A No, the process.

1 vapor into the plant.

2 Q Is there any way to test that?

3 A Yes.

4 Q How would you test that?

5 A You can test versus the outside. You
6 take a measuring device that's going to measure
7 temperature and wet-bulb temperature or temperature
8 and absolute humidity. There is different devices
9 that you can tell how much moisture is being added.

10 Q And for this case, did -- did you do
11 any type of model or any type of testing -- well,
12 withdrawn. Let me ask you this first: Are the water
13 vapor-producing equipment that you referred to still
14 operating at Federal-Mogul?

15 A The understanding I had was the plant
16 was running at -- up until the time it was shut
17 down --

18 Q I'm sorry to cut you off. Not that
19 day. I am talking about after the explosion and when
20 you got the request to do your review in this case.
21 Do you know, as of today or at any time since you have
22 had it, whether or not that equipment is still being
23 used?

24 A I don't have any direct knowledge.

1 were all installed at the same time for this
2 production line, would mean there would be vapor --
3 free water vapor in the air.

4 Q Okay. And that would be for the entire
5 plant?

6 A Well, I mean, you would have just in
7 the -- I looked at just the area of where they were
8 doing the production side of it.

9 Q Okay. With respect to the water
10 vapor-generating equipment, okay, does that raise the
11 relative humidity of the air for the entire plant?

12 A Yes. Relative humidity is a number
13 that says just exactly what it is. It's relative to
14 how much moisture does it have versus how much
15 moisture can it have. So what it was actually doing
16 was raising the entire dew point of the plant.

17 Q Didn't you do any calculations for the
18 extent to which the dew point was raised in the
19 plant --

20 A No.

21 Q -- as a result of this equipment?

22 A Other than my experience with wet dust
23 collectors is you are putting water vapor into the
24 plant. You have got employees that are putting water

1 Q Or whether it was actually done?

2 A That was outside of the scope of what I
3 was looking at.

4 Q You mentioned specifically water
5 vapor-generating equipment in the plant?

6 A Yes.

7 Q Where did you get information about
8 that subject?

9 A From the proposal -- or from
10 Federal-Mogul's specs on the original project, it
11 required two dry dust collectors and then two wet dust
12 collectors for the process, a different part of the
13 process. A wet dust collector works by either
14 spraying water into the air to take out the
15 particulate or by running the air through a tank and
16 through a bath to remove the particulate as well.

17 Q Okay.

18 A There was talking about -- then their
19 specifications also had a sludge-handling equipment,
20 which meant what was coming off of the dust collector
21 is going to be a mixture of both particulate and water
22 that's going to come out wet to be dried.

23 So just the inclusion of those two
24 pieces of equipment in the general area, because they

1 procedures of the workers?

2 A When I teach it and teach safe
3 operation of dust collectors, lockout/tagout is a big
4 issue in it.

5 Q Okay. And are you familiar that with
6 lockout/tagout that it's the individual working on the
7 equipment that's responsible for making sure that's
8 done? Are you familiar with that standard?

9 A Yes. And I don't know who locked out
10 what or how many locks were on it.

11 Q Okay.

12 A Or what Federal-Mogul's internal
13 procedures are or requirements.

14 Q Let's see. Now, this may be similar,
15 but the operational condition of the plant, I guess
16 that -- we are talking about the same thing, either --
17 whether that's the machines or the dust collection
18 system. And, again, you were just provided the
19 information that there was a lockout and tagout, but
20 you are not -- you don't have any information as to
21 whether or not that was checked by the plaintiffs?

22 A No.

23 Q Or who did it?

24 A That was outside the scope --

1 Q -- and were told either by plaintiffs'
2 counsel or --

3 A Either in deposition or that it was
4 locked out and tagged out. That was also part of
5 LCM's proposal is that the lockout/tagout would be by
6 Federal-Mogul.

7 Q And while we are talking about
8 lockout/tagout, are you offering any opinions with
9 respect to the safety procedures followed by the
10 plaintiffs or LCM in their work here?

11 A No, other than I know, you know, safe
12 work around the -- around combustible dust. I teach
13 it. I do seminars on it.

14 Q So, for example, Mr. -- I want you to
15 assume Mr. Hodges testified at his deposition that he
16 did not check to see whether or not the Federal-Mogul
17 equipment was locked out or tagged out or whether the
18 bag house -- the dust collecting system had been
19 locked out and tagged out. You are not here to offer
20 any opinion as to whether that's proper procedure or
21 otherwise; is that correct?

22 A I have no information on that.

23 Q Okay. Is that something that would be
24 within your expertise, to evaluate the safety

1 I have seen between a half hour and an hour and a
2 half.

3 Q Do you remember where you got that
4 information from?

5 A No. It could have been provided by
6 counsel.

7 Q In what form? By --

8 A Just asking a question and statement.
9 Or it may have been in one of the depositions. I am
10 not sure.

11 Q But did you do anything to verify that
12 other than either being told by counsel or maybe
13 reading it in one of the depositions?

14 A No. I didn't contact the plant or
15 anybody at that point. I requested -- I mean, I
16 requested that information, and that's what I was
17 told.

18 Q I guess the other one similar to that
19 was whether or not the dust collector system was
20 operating at the time, correct?

21 A Yes.

22 Q Okay. And that's information that you
23 asked was it on at the time --

24 A I have seen that --

1 go through and eliminate the potential sources of
2 ignition, correct?

3 A Yes.

4 Q And when you do that, do you have a
5 process whereby you go through eliminating the least
6 likely to the most likely? Or do you go most likely?
7 Do you have a process to do that?

8 A I look at what the impact of each one
9 of them would be and whether that was available, you
10 know, that -- like say the process equipment, whether
11 it was running or not. If it's not running, then
12 that's -- eliminates it as a source. I look through
13 each one of them equally to make that decision.

14 Q So based on the list that you gave me,
15 it's fair to say that there were some that you easily
16 eliminated as a source of ignition?

17 A Yes.

18 Q First being the Federal-Mogul equipment
19 because, based on the information provided to you,
20 that equipment had been shut down that day, correct?

21 A Uh-huh, yes.

22 Q And do you know how long it had been
23 shut down for prior to the work on the ductwork?

24 A I was told anywhere from a half hour --

1 A If they were -- if there was a reason
2 as a flashlight breaking or any source -- external
3 source of electrical spark.

4 Q Okay.

5 A If the dust collectors were operating,
6 which I am told they were not, that they were
7 electrically locked out. Again, the type of material,
8 the aluminum dust.

9 Q Okay. Anything else?

10 A The condition of settling in the
11 ductwork of the aluminum dust. You know, if there was
12 an ignition source from the process equipment, which I
13 am told was locked out.

14 Q When you say process equipment, you
15 mean the Federal-Mogul equipment?

16 A The Federal-Mogul equipment, not the
17 dust collection. NFPA will tell you ignition sources
18 are free. You can never design all the ignition
19 sources out of a system. You could have a short
20 circuit. You can have lightning come in on it. There
21 is a lot of different sources of ignition.

22 Q Understood. And --

23 A Exothermal.

24 Q Sure. And part of your process is to

1 documents, did you have various possible causes that
2 you were considering?

3 A Yes.

4 Q And can you tell me what causes you
5 were looking at or what sources of ignition you were
6 looking at as the cause of the explosion?

7 A When I looked at the entire system --
8 and, again, taking the video out of it, I looked at
9 the role of what the workers would have been doing.

10 Q When you say the workers, who are you
11 referring to?

12 A The three individuals that were
13 injured, the two --

14 Q The LCM employees, the plaintiffs, not
15 the Federal-Mogul employees?

16 A No, the LCM employees.

17 Q Okay. So you look at what were the
18 plaintiffs doing.

19 A What were the weather conditions, what
20 was the operational condition of the plant.

21 Q Okay.

22 A Was there water-generating or vapor --
23 water vapor-generating equipment in the plant.

24 Q What else?

1 operating. Is that fair?

2 A Based on that information, the
3 information provided, yes.

4 Q Based on the information that you have
5 had to reach your opinion, that's -- that's the key to
6 determining what the cause of this explosion was,
7 correct?

8 A Yeah. Yes.

9 Q Okay. And in determining what the
10 ignition source was, that would also help to determine
11 where the origin of the explosion was as well,
12 correct?

13 A Yes. Again, looking at the video --

14 Q Well, there is no question before you.
15 There is no question before you, so --

16 A That could be carrying off from the
17 last one, so...

18 Q Okay. So in terms of your
19 investigation of this incident, is it fair to say that
20 you came to a point where you had to focus on what was
21 the source of ignition for the explosion on December
22 31?

23 A Yes.

24 Q And at your initial review of the

1 was no.

2 Q Okay. So -- and again just to go back,
3 so the dispersion of the dust cloud was a condition
4 that would have been present on any day prior to this
5 as well, correct?

6 A Yes.

7 Q Okay. Containment. When you say
8 containment, what are you referring to?

9 A The dust collector itself.

10 Q And when you say the dust collector, is
11 that --

12 A The enclosure of the bag house.

13 Q So that's not the 55-gallon drum that's
14 at the bottom? Or is that part of it?

15 A It could be. It could be. If it's not
16 isolated, that's included in that volume as well.

17 Q Okay. And, clearly, that containment
18 system had been present since the system had been
19 installed and operated?

20 A Yes.

21 Q So the only -- only factor that we have
22 to consider is what's the source of ignition in terms
23 of what's different on this day to cause the explosion
24 than any other day that this system has been

1 is present on a daily basis in this system?

2 A Yes. And a dust collector is a perfect
3 product classifier. The heavy particles fall down
4 onto the -- into the hopper. The light particles go
5 up onto the bags. The filtration is actually provided
6 by a dust cake on those bags. It's like your home
7 furnace filter. About the time that you look at it
8 and it's all dirty, it's finally starting to work. So
9 at that point you -- using the dust is actually what's
10 providing the filtration efficiency on the dust. The
11 dust collector in normal operation is going to pulse
12 off that dust down into the -- into it, but, also, a
13 dust collector that's shut down will experience dust
14 falling off of the bags over a period of time.

15 Q So fair to say that the bags don't get
16 rid of everything while it's on?

17 A And they don't clean while it's --
18 while it's -- they don't completely clean when you
19 turn it off.

20 Q Okay.

21 A You can also end up with buildup on the
22 walls of the dust collector. And I think in one of
23 the depositions it was asked had the dust collector
24 ever been cleaned or the bags changed, and the answer

1 That's something that is present at all times and had
2 been present in this system every day, correct?

3 A Yes.

4 Q Okay. Fuel. In this case, what, in
5 your opinion, was the fuel for the explosion?

6 A The aluminum dust.

7 Q And, again, the aluminum dust was
8 something that had been present in the system since it
9 started operating some seven years earlier, correct?

10 A Yes.

11 Q And was there any difference on this
12 day in terms of the characteristics of the aluminum
13 dust in the system?

14 A I -- without, you know, analyzing the
15 dust, I would assume that the same equipment and their
16 process is the same day after day, and the dust is
17 going to be the same every day that goes into it. I
18 have no information of a process change that was made
19 prior to this or that had been made in the seven
20 years.

21 Q All right. I am going to skip over
22 ignition source for just a second because I know you
23 already mentioned the exothermic reaction there.
24 Dispersion of the dust cloud, is that a condition that

1 In the -- by having a dust collector
2 that's handling combustible metals, especially, it's
3 important that the dust collector not have
4 condensation on the inside of the dust collector.

5 Based on the weather data that I
6 reviewed as well as the fact that the plant has wet
7 dust collectors that will be adding moisture to the
8 air on the inside of the plant, that the probability
9 -- or, in my opinion, is is that the dust collector
10 was condensing. The material that was in there had a
11 exothermic reaction. The exothermic reaction caused
12 the explosion. And all of those things are
13 independent of what they were doing in the ductwork or
14 what somebody was doing on the other end of the plant.

15 Q Okay. Let's -- well, let's go through
16 what was present on that day. And I will ask this in
17 a -- I may ask this a couple ways. So if I say it in
18 a confusing way, please let me know.

19 A Okay.

20 Q I will rephrase the question, or we
21 will repeat it back so that we make sure that we are
22 talking about the same thing.

23 You said five things need to be present
24 for an explosion to occur. The first one is oxygen.

1 the explosion occurred on that day?

2 A Explosions don't really pick what day
3 they want to happen. It's a coming together of, you
4 know, multitude of things all at one time. Nobody
5 gets up and schedules one for 10 o'clock in the
6 morning. So it could have -- it could have happened
7 that day, and it could have went 40 more years without
8 running.

9 Q Okay. Well then --

10 A The length of time really doesn't --
11 the length of time that the equipment has been running
12 does not make it any safer. I have a lot of customers
13 that say, well, we have run 20 years without an
14 explosion. Say, well, yep, you ran 20 years without
15 an explosion, and you had one. What happened in the
16 first 20 years.

17 Q Well, I guess that's where I am going
18 next is, then what are the factors that need to be
19 present or were present on December 31, 2010, that, in
20 your opinion, brought about this explosion?

21 A To have an explosion, you need five
22 things: You need oxygen, you need fuel, you need an
23 ignition source, you need dispersion of the dust
24 cloud, and you need containment.

1 know, based on all of those things and where I
2 determined the explosion originate, it would have made
3 no difference if they were working on it or not
4 working on it.

5 Q Okay. Why is that?

6 A Because I don't think they had -- in my
7 professional opinion, the explosion didn't originate
8 at the employees. It originated in the dust
9 collector, and there was nothing that the employees
10 were doing that was going to change that fact or
11 contribute to it in the dust collector per my
12 findings.

13 Q All right. And this ventilation system
14 had been operating for approximately seven years --

15 A Yes.

16 Q -- prior to this day?

17 A Uh-huh.

18 Q Okay. Were there any conditions that
19 were present on December 31, 2010, that were different
20 than any other day that it had been operating up until
21 then?

22 A I don't have that information.

23 Q Okay. Do you have an opinion with a
24 reasonable degree of engineering probability as to why

1 Q Okay. If Mr. Hodges, Mr. Bonds, and
2 Mr. Spangler were not present cleaning the ductwork at
3 Federal-Mogul on December 31, 2010, would that
4 explosion have occurred?

5 A Could that explosion have occurred, or
6 would that --

7 Q I am asking first would that.

8 A It's possible that the explosion could
9 have occurred based on the information that I have
10 saw. The role that the employees played in that
11 decision -- or in that explosion, it's -- I would say
12 based on what I found, it could have exploded without
13 them being there. That's my -- my professional
14 opinion is, is from what I saw and working on
15 different dust collectors like that that there's a
16 possibility that that could happen.

17 Q Okay. So to put it another way, I
18 suppose -- well, let me go into another question with
19 that. Do you have an opinion as to whether or not any
20 of the actions taken by the plaintiffs that day in
21 cleaning the ductwork caused or contributed to the
22 explosion occurring specifically on that day?

23 A From my analysis of the explosion and
24 of the equipment and the videotape and the -- you

1 that correct? Are those two different things, or is
2 that the same?

3 A Yes, it's two different things.

4 Q All right. Let me ask you this
5 question: In -- I understand that this was a -- the
6 event took place on December 31 of 2010, correct?

7 A Per the information that I have been
8 handed, yes.

9 Q Okay. And that was at the
10 Federal-Mogul plant in Blacksburg, Virginia, correct?

11 A Per the information that I have been
12 provided, yes.

13 Q So my question to you is: Would this
14 event have occurred on December 31, 2010, whether or
15 not the plaintiffs were at the Federal-Mogul plant
16 that day?

17 A Can you clarify? I don't understand.

18 Q Sure. We know an explosion occurred on
19 that day, and we know that the three plaintiffs were
20 there for LCM cleaning the ductwork. My question is:
21 Was -- would that explosion have occurred on December
22 31, 2010, whether or not the plaintiffs, as LCM
23 employees, were there cleaning the ductwork that day?

24 A Try one more time.

1 been a component in making those decisions. But
2 looking at the actual equipment that as it was
3 destructured, it wouldn't have changed my opinion of the
4 designs.

5 Q Okay. And, again, I am trying to
6 separate two parts out here, because part of your
7 opinion seems to be that the ventilation system
8 itself -- that you were reviewing its design at the
9 outset.

10 A Uh-huh.

11 Q Whether it was capable of performing
12 the functions that it was intended to do at that time;
13 is that correct? That's one aspect?

14 A Based on the information that was
15 available.

16 Q Okay.

17 A Publicly available at that time.

18 Q All right. The second thing that you
19 are referring to here is looking at the event of the
20 explosion itself.

21 A Yes.

22 Q And whether or not the component parts
23 that had been selected as part of that design were
24 appropriate based on that event and what occurred; is

1 information to make a determination is, was the
2 information that would have been available at the time
3 that the equipment was selected, if that was -- if the
4 equipment was selected for that -- you know, based on
5 that information or also reviewing the explosion is
6 did a higher pressure or a higher Kst did the
7 equipment experience in the explosion.

8 Q Is it fair to say that if you had that
9 information, you could give a more precise or a more
10 certain opinion with respect to the design of the
11 ventilation system?

12 A It would have been part of making the
13 analysis of it, but it wouldn't have changed the
14 outcome of my opinion.

15 Q Okay. Why not?

16 A Because the equipment -- the
17 destruction of the equipment indicated that the -- in
18 the case of the dust collector, that the vent weren't
19 properly -- or weren't large enough to release the
20 vents, and the dust collector tore itself apart or had
21 structural failure. In the case of the back blast
22 damper, it structurally failed due to the pressures.

23 Again, that doesn't -- changing --
24 changing knowing what the dust going into would have

1 the application.

2 Q And since that information is not
3 available, does that have any impact on your certainty
4 or your opinion as to what you have expressed in your
5 report here?

6 A It has had an impact in what was the
7 final -- or the initial design information to -- and
8 by -- let me get my thoughts together here.

9 Q Well, let me see if I can ask it more
10 specifically. You said one of the things that you
11 were reviewing was the design of the system itself.
12 How would knowing the composition of the dust affect
13 your opinion in this case on the design of the system?

14 A It would determine if the dust
15 collection equipment and the dust collection system
16 was capable of withstanding the pressures and the
17 selection of the equipment would react fast enough for
18 the type of dust that was -- it was asked to filter.

19 Q And without that information, were you
20 able to reach an opinion as to the design of the
21 system?

22 A Based on the destructive forces that I
23 observed on the equipment -- and, again, this is based
24 on -- this is what I do all the time. Backed into the

1 A Minimum ignition energy that it would
2 take to ignite it, minimum explosive concentrations,
3 things that you would use to analyze the dust and the
4 proper selection of the equipment.

5 Q For the ventilation system itself?

6 A For the ventilation system itself,
7 including the dust collector, ductwork.

8 Q And why would that be important to your
9 final opinion?

10 A To determine the cause of the
11 explosion; determine the severity of the explosion in
12 the dust collector, in the backdraft damper, and in
13 the ductwork; to determine the origin of the explosion
14 as well as severity of the dust cloud that was -- or
15 the gasses that were given off by it.

16 Q And, again, so you are referring to
17 dust that was collected in the ductwork itself as well
18 as the dust that was present in the bag house at the
19 time?

20 A Yes. The reason that is is to properly
21 select the equipment and the explosion protection, you
22 have got to know the numbers of the Kst, which is rate
23 of pressure rise over rate of time, and pressure
24 maximum to decide the selection of the equipment for

1 Q And can you explain to me what you mean
2 by dust testing of the aluminum dust?

3 A The dust test would have been provided
4 by a company similar to Chilworth, Fenwal, where they
5 actually run the chemical characteristics and have --
6 explode the dust to measure what the rate of rise of
7 the pressure over time, delta P over delta T, which is
8 used in calculating Kst, and also Pmax, which is the
9 maximum pressure involved in the explosion.

10 I was told that the dust had not been
11 tested prior to that, that there was dust that --
12 there was dust samples available. But due to the time
13 since the explosion, unless it was really tested prior
14 to the explosion, anything after that point wouldn't
15 give you an accurate representation of what was in the
16 dust collector or the ductwork at that time.

17 Q Okay. And, again, sometimes I will
18 need to go and clarify just so that I understand.
19 Your interest in finding out was what the components
20 were of the dust that was described as being in the
21 vents at the time of the explosion, correct?

22 A Both components and the chemistry of
23 it, what the explosive values of the material was.

24 Q All right.

1 A No.

2 Q Have you had any personal interviews
3 with any other LCM employees, such as Danny Collins?

4 A No.

5 Q Prior to preparing your report for
6 plaintiffs' counsel, did you request any additional
7 information that was not provided to you? You know,
8 let me withdraw that and ask it another way. Have you
9 asked for any information from plaintiffs' counsel
10 that has not been provided to you?

11 A There is nothing that I have asked for
12 that's not been provided to me. To give you a more
13 full answer, on the -- what I reviewed and the
14 information is in my report on Pages 7, 8, 9, and 10.
15 So that's more of a total listing of what I received
16 and what I reviewed.

17 Q And I understand that. I understand
18 what you did use. I am just asking if there was
19 something that you asked for that you were told either
20 it doesn't exist or we don't have it or we will get it
21 for you, anything like that.

22 A The only information that I asked for
23 that was -- that I was told was not available was dust
24 testing of the aluminum dust prior to the explosion.

1 from witnesses who were present at the time of the
2 event?

3 A The reports that I see from OSHA are
4 usually at the citation level, not at the
5 investigation level.

6 Q Would you agree with me that having
7 statements from witnesses who were present at the time
8 of the event is important in a full evaluation of the
9 causes of an event such as this?

10 A From the information that I have seen
11 and the depositions that I have read, I felt those
12 were the key players in the evaluation of the
13 explosion and didn't require any additional workers or
14 any additional information.

15 Q Have you ever read any statements from
16 any Federal-Mogul employees who were present at the
17 time of the explosion?

18 A I am not sure if David Garard was at
19 the -- present at that time or not.

20 Q And David Garard is the only
21 Federal-Mogul employee whose statements --

22 A That I can recollect right now.

23 Q Have you ever had any personal
24 interviews with any of the plaintiffs in this case?

1 provided.

2 Q Did you have any reports regarding the
3 investigation of the explosion?

4 A By?

5 Q By the Blacksburg Fire Department, by
6 OSHA, by any governmental agency.

7 A I have looked at the -- and this was
8 when we got in to do the site visit and the analysis
9 of the -- of all the information, I looked at the fire
10 department's evaluation. Did not look at OSHA's
11 evaluation.

12 Q Is there some reason you have not
13 looked at the OSHA report?

14 A No.

15 Q Would that contain information that
16 would be helpful to you in reaching a hypothesis or an
17 opinion in this matter?

18 A I don't feel that OSHA would have
19 anything in their report that would be more than what
20 was provided by the other information that I got.

21 Q Are you familiar with OSHA reports that
22 are done in situations such as this?

23 A Yes.

24 Q Do those reports contain statements

1 first time?

2 A I think August, early August.

3 Q Of this year?

4 A Of this year.

5 Q So between November of 2011 and August
6 of 2013, there was a continuous stream of information
7 being provided to you by the plaintiffs' counsel?

8 A Yes. I mean, not every day did I
9 receive something on it, but it may go two or three
10 months and I would review something, and then maybe a
11 month later I'd end up reviewing something.

12 Q Okay. Prior to your first visit to the
13 site in August of 2013, at that point -- prior to that
14 time, what written information or documentation did
15 you have other than what we have already discussed,
16 which is the video, the deposition transcripts of the
17 plaintiffs and the Federal-Mogul employees, and the
18 design --

19 A Design information.

20 Q -- information and the exhibits from
21 the depositions?

22 A The order information from -- for
23 Dustex, the order information for Kirk & Blum, all
24 relative documents about the equipment of what was

1 in the system, make sure that it was -- met the
2 function required, NFPA requirements, or the safe
3 operating.

4 Q You said earlier independent review of
5 all the information. At this point in time, all
6 you've told me that you have received were the
7 depositions of the plaintiffs and the Federal-Mogul
8 employees and the exhibits with those depositions.

9 A I guess the --

10 Q Is that correct?

11 A The initial part of it, the initial
12 contact would be to do that independent review. As
13 the depositions came in and requested different
14 information that was provided, I reviewed that
15 information. But the scope of what my direction was
16 was to take a look at the total system and analyze the
17 system and its components.

18 Q Is it fair to say that in order to
19 analyze the system and its components, then all you
20 needed was the deposition exhibits and the design
21 plans that you referred to?

22 A And also to visit the site, look at the
23 equipment.

24 Q When did you visit the site for the

1 specific aspect of the incident?

2 A No.

3 Q Were you asked the question like we'd
4 like to hear your opinion on what the cause of the
5 explosion was or some other aspect of this?

6 A No. What I was asked for was an
7 independent review of all the information with really
8 no pressure to say here is what your answer needs to
9 be in the end of it. A big part of my business is
10 providing that for manufacturing companies, is review
11 what they have to see if it's in compliance or where
12 they are deficient.

13 Q And that's where I was going, whether
14 they were asking you to evaluate, for example, the
15 ventilation system that was in place to determine
16 whether or not it was in compliance, if that was the
17 request, or if the request was can you provide us your
18 opinion on the function of the various components of
19 the system in the explosion that occurred.

20 A In both of those. In our business when
21 we do an analysis, we look at each piece of equipment.
22 If I was called into a plant to look at their dust
23 collection system to see if it was in compliance, we
24 would look at the total system and then each component

1 when I received any of the information. It's just
2 been ongoing.

3 Q Other than the deposition transcripts,
4 in terms of your initial review of the case, was there
5 anything else that you referred to when you first were
6 retained?

7 A No.

8 Q Did there come a point in time that you
9 requested additional documents from plaintiffs'
10 counsel for your review?

11 A Yes.

12 Q What documents did you request?

13 A Just design information from Dustex,
14 and I think it's more of the -- along the line of
15 exhibits that were in -- or information that was in
16 the depositions.

17 Q And again referring to the depositions
18 of the plaintiffs and the Federal-Mogul employees?

19 A Yes. Again, the exact timeline of when
20 I received what, I could go back and reconstruct it
21 maybe from e-mails or telephone conversations, but I
22 don't really recollect when that was -- happened.

23 Q When you were first retained to review
24 the case, were you asked to focus your review on any

1 you found news reports about the explosion that
2 occurred at the Federal-Mogul plant as part of your
3 ongoing professional duties?

4 A Yes.

5 Q Did there come a point in time that
6 plaintiffs' counsel provided you with a factual
7 background regarding their clients and/or the
8 incident?

9 A Yes. At what time or the dates, I am
10 not sure.

11 Q I'm more interested in what -- what
12 information was provided to you.

13 A Started -- the best of my memory, it
14 started with depositions.

15 Q Okay. And depositions of?

16 A Depositions of the employees that were
17 injured, depositions from Federal-Mogul's employees.

18 Q Did you receive those -- were they
19 transcripts of the depositions?

20 A Yes.

21 Q And did you receive those before you
22 received any other written materials relating to this
23 incident?

24 A I really don't have a good timeline on

1 for this case?

2 A No.

3 Q Was that done by another meeting, a
4 phone call, a letter?

5 A Best I can remember, another phone
6 call.

7 Q Were you given any additional
8 information about the case through that phone call?

9 A No, just to discuss the -- whether I
10 was interested in working with them on the case.

11 Q And was there a general discussion of
12 what the case was about at that time?

13 A Yes.

14 Q Can you tell me what you recall about
15 that conversation?

16 A I also knew from news reports what the
17 case was about as well.

18 Q And had you looked at the news reports
19 on your own or at the request of Mr. Brown and
20 Mr. Johnson?

21 A On my own in that I do a lot on web
22 sites and with the chemical safety board. I am not
23 sure where it would have come up at.

24 Q Okay. And again so that I am clear,

1 case that you were working on?

2 A Uh-huh.

3 Q And while you were having that meeting,
4 there was a discussion about this case?

5 A Yes.

6 Q And after viewing the video, did you
7 offer any opinions or information on what further
8 documents or data you would need?

9 A No, not at that time.

10 Q All right. Did there come a point in
11 time that you were retained to review additional
12 documents in this case?

13 A Yes.

14 Q When was that?

15 A I am not real sure of the dates, but
16 would have been within the last year.

17 Q You said the case was first mentioned
18 to you in November 2011?

19 A Yes.

20 Q So sometime during 2012 was when you
21 were contacted, or was it in 2013?

22 A I don't recollect.

23 Q Do you have any documents that would
24 refresh your recollection as to when you were retained

1 A I think November of 2011.

2 Q Who was it that contacted you?

3 A Mr. Brown and Mr. Johnson.

4 Q Was that in person or by phone?

5 A In person.

6 Q And was that here in Roanoke or at your
7 offices in South Carolina?

8 A It was in Hilton Head while I was on
9 vacation.

10 MR. ALEXANDER: Only you?

11

12 BY MR. MORRIS:

13 Q Prior to that meeting, had you received
14 any contact, any documents, any information about the
15 case?

16 A No.

17 Q Can you tell me what information you
18 were provided about the case at that first meeting.

19 A We were -- just reviewed video of the
20 explosion, discussed just the video, and that was the
21 extent of it. The main part of the meeting was for a
22 different case I was working with Mr. Brown on.

23 Q I see, okay. And just so that I am
24 clear, so the meeting was set up to discuss another

1 today, did you bring any written materials with you?

2 A Other than the report and just really
3 what's been issued, no. Nothing else in writing. No
4 notes.

5 Q When you say issued, what -- what are
6 you referring to?

7 A The report that I issued.

8 Q Okay. Do you have any documents that
9 have been provided to you by plaintiffs' counsel?

10 A Yes.

11 Q What documents do you have that were
12 provided to you by plaintiffs' counsel?

13 A They were detailed in the report.

14 Q Okay. So in the report there is a
15 listing of all the references in terms of documents
16 related --

17 A Yes.

18 Q -- to this case. And other than those,
19 you have no other documents?

20 A At this time I cannot think of any
21 other documents that I was provided since then.

22 Q Can you tell me when you were first
23 contacted by plaintiffs' counsel with respect to this
24 matter?

1 Doug Edwards?

2 A Yes.

3 Q Who is Doug Edwards?

4 A Doug Edwards was my counterpart in
5 Cincinnati. He was the director of engineering and
6 was responsible for the engineering portions of
7 Kbd/Technic in Cincinnati.

8 Q And during the time that you worked at
9 Kbd/Technic, did you ever work on any projects
10 together with Mr. Edwards?

11 A Yes.

12 Q And can you tell me what each of your
13 roles were in those projects?

14 A I would either be lead designer and he
15 would be a support or the other way around, and I
16 would provide engineering support for -- on his
17 projects.

18 Q Okay. So it's a collaborative effort
19 for --

20 A Collaborative effort.

21 Q And that would be for a client of
22 Kbd/Technic?

23 A Yes.

24 Q With respect to your deposition here

1 report that you provided to the plaintiffs' attorneys.

2 For purposes of the record, can you
3 please give us your name and your address.

4 A Martin Schloss, 103 Hickory Hill Lane,
5 Greenville, South Carolina, 29609.

6 Q Mr. Schloss, as I said, I represent
7 Kirk & Blum. Are you familiar with Kirk & Blum?

8 A Yes.

9 Q And how is it that you are familiar
10 with Kirk & Blum?

11 A I worked for a sister company of Kirk &
12 Blum, Kbd/Technic.

13 Q When did you work for Kbd/Technic?

14 A 2000 -- let me check here. 2007 to
15 2010.

16 Q And what was your position with
17 Kbd/Technic?

18 A Southeast regional manager.

19 Q What were your job duties?

20 A Responsible for the design,
21 engineering, sales, and operations of the southeast
22 region of the consulting engineering company.

23 Q During the time that you worked at
24 Kbd/Technic, did you ever have any encounters with